

KENNECOTT UTAH COPPER CORPORATION

# SOUTH FACILITIES GROUNDWATER REMEDIAL ACTION PROGRESS REPORT

2002-2004

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Div. of Oil, Gas & Mining



JULY 2005



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- A Water Chemistry Data, 2002-2004
- B Water Level Monitoring Data, 2002-2004
- C Tailings Monitoring Data, 2003-2004
- D Tailings Monitoring Report

## **1. INTRODUCTION**

Kennecott Utah Copper Corporation (KUCC) is conducting groundwater remediation at its South Facilities as selected by the U.S. Environmental Protection Agency (EPA) and the Utah Department of Environmental Quality (DEQ) in a Record of Decision (ROD) dated December 13, 2000 for the Kennecott South Zone, Operable Unit 2. In response to the ROD, KUCC submitted a Final Design for Remedial Action (RDRA) for the groundwater remediation in December 2002. EPA and DEQ approved the remedial design and issued an Explanation of Significant Differences (ESD) in June 2003.

KUCC committed in the RDRA to prepare annual reports on remedial activities and remedial progress. This report describes remedial activities and results for calendar years 2003 and 2004 and also reports data collected during 2002.

Groundwater contamination at the South Facilities, referred to as the Zone A Plume or the Acid Plume, is immediately downgradient of the old Bingham Reservoir and waste-rock piles and consists of a core area with low pH and elevated metals which is surrounded by a partially to fully neutralized zone of elevated ( $>1,500 \text{ mg/l}$ ) sulfate groundwater.

The technical components of the selected South Facilities groundwater remedy include:

- Maintaining source control measures
- Containing the acid plume in Zone A through extraction from barrier wells at the leading edge of the contamination and wells in the core of the plume.
- Remediating the Zone A plume through extraction of heavily contaminated waters from the core of the plume.
- Treatment of extracted barrier well water by reverse osmosis (RO) technology for barrier well water and by neutralization of acid well water in the tailings pipeline.
- Monitoring and reporting progress.

Additionally, the selected remedy includes preventing human exposure to unacceptably high concentrations of hazardous substances and/or pollutants through point-of-use management. KUCC responded to five requests in 2003 and seven request in 2004 by third-party groundwater users in the area to have well water sampled and analyzed. Results indicated point-of-use management was not needed.

## **2. REMEDIAL OPERATIONS**

### **2.1 Groundwater Remediation System**

KUCC has largely completed construction of groundwater extraction and treatment systems necessary to implement the remedy. Constructed components of this system are:

- Barrier well extraction system consisting of three wells, B2G1193, BFG1200, and LTG1147, and conveyance lines to deliver water to an RO treatment plant.
- Acid well extraction system comprised of two wells, ECG1146 and BSG1201, and conveyance to the beginning of the tailings pipeline at the Copperton Concentrator.
- Acid plume water treatment system which relies on operating KUCC milling facilities, specifically a) the tailings pipeline, which serves as a 17-mile plug-type treatment reactor; b) the Copperton Concentrator lime plant, which has ability to add hydrated lime directly to the tailings line as needed, and c) the North Tailings Impoundment, which provides a repository for non-hazardous treatment residuals.

KUCC has constructed and operated a demonstration reverse osmosis treatment plant near Copperton. A full-scale RO plant will be completed in 2005.

### **2.2 Extraction and Treatment**

Annual calendar-year extractions from the remedial wells in Zone A are reported in Table 2.1.

**Table 2.1 Annual Zone A Groundwater Extraction (ac-ft)**

	<b>2002</b>	<b>2003</b>	<b>2004</b>
<i>Barrier Well Extraction</i>			
B2G1193	2808.03	2666.86	1936.47
BFG1200	2778.48	2654.22	2389.62
LTG1147	103.83	639.05	1106.32
<i>Total</i>	<i>5690.34</i>	<i>5960.13</i>	<i>5432.41</i>
<i>Acid Well Extraction</i>			
ECG1146	1021.72	954.40	1114.54
BSG1201	0	550.83	1281.94
<i>Total</i>	<i>1021.72</i>	<i>1505.23</i>	<i>2396.48</i>

Flow from the barrier wells was used as process water in KUCC's operations during 2002-2004. A portion of the flow was diverted to the Demonstration RO Plant for ongoing testing. Treated volumes are indicated in Table 2.2. Treated water was also utilized in KUCC's process water system.

**Table 2.2 Annual Pilot Plant RO Treatment (ac-ft)**

	<b>2002</b>	<b>2003</b>	<b>2004</b>
RO Treatment	361.7	843.7	813.6

In March 2003, KUCC installed a second acid well, BSG1201 near the leading edge of the low pH plume. Extraction from this well began in August 2003. All groundwater extracted from acid wells was conveyed to the KUCC tailings line at Box NP-5 where it was treated in the tailings system.

### **3. REMEDIAL PROGRESS**

Analysis of groundwater monitoring data indicates that the remedial extraction program is achieving progress in terms of both contracting the groundwater plume and reducing contaminant levels within the plume. KUCC monitors a large suite of water quality parameters, among which several are specifically useful in assessing remedial progress including sulfate, aluminum, other selected metals, and pH. Changes in concentrations of these parameters in Zone A groundwater are discussed below.

All water chemistry data collected during 2002, 2003, and 2004 are reported in Appendix A. Samples were analyzed at Kennecott Environmental Laboratory, a State of Utah certified analytical laboratory. There are 100 wells included in the groundwater monitoring program which sampled on a frequency and for the parameters listed in the RDRA Monitoring Plan (KUCC 2002, Section 3.2.3). In addition, chemistry data from wells sampled as part of other KUCC monitoring programs are included in the evaluation below.

KUCC's Groundwater Monitoring and Characterization Plan (GCMP; KUCC 2005a) and associated Standard Operating Procedures (SOPs; KUCC 2005b) are followed for all sampling and water level measurements. The GCMP has been approved by the Division of Water Quality and is updated on an annual basis. Quality-control procedures, as documented in KUCC's Quality Assurance Project Plan (QAPP; KUCC 2005c) for the GCMP program, are followed for all data collected. KUCC submits quarterly Quality Assurance Reports to the Division of Water Quality. These reports discuss quality assurance for the data utilized below to assess remedial progress.

#### **3.1 Sulfate**

The distribution of sulfate in Zone A is represented on Figure 3.1 which compares contoured sulfate concentrations<sup>1</sup> for both 1996<sup>2</sup> and 2004<sup>3</sup>. Data from 1996 are used as a baseline because 1) this is the earliest dataset available which thoroughly represents the spatial distribution of sulfate, and 2) the data represent the time frame prior to installation and operation of the first acid extraction well (ECG1146) and initiation of active remediation.

On Figure 3.1, areas where the plume has contracted for a particular contour interval are indicated by green hatching; areas of expansion are indicated by orange hatching. It is apparent from Figure 3.1 that there has been significant contraction of the plume. Specific areas of the plume are discussed below.

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<sup>1</sup> The highest sulfate concentration at any depth for each nested well site was used to draw contour lines.

<sup>2</sup> The 1996 contours were drawn predominantly with data from 1996, but some data from wells drilled and first sampled in 1997 and 1998 were also used in support of the 1996 contours.

<sup>3</sup> Data used in the placement of the 2004 contours are predominantly 2004 analytical data. For wells that were not sampled in 2004, sulfate trends as well as changes in the induction logs of wells between 1996 and 2003 were used to estimate water quality.

### **3.1.1 Plume Core**

In 1996, 15 wells had sulfate concentrations greater than 20,000 mg/l, which then generally defined the plume core. In 2004, only four wells remain with a sulfate concentration greater than 20,000 mg/l. Of these four wells, ECG1146 and ECG1128A have both declined in concentration from above 30,000 mg/l to just above 20,000 mg/l (Figures 3.2 and 3.3). ECG1115A has remained relatively constant at above 30,000 mg/l (Figure 3.4), and ECG1115C has seen a significant increase from 4,660 to 31,200 mg/l (Figure 3.4). It should be noted that ECG1115B (located at the same geographic location as ECG1115A and C) has also seen a significant increase in sulfate from 2,240 to 12,800 mg/l (Figure 3.4).

Increasing sulfate concentration in wells ECG1115C and ECG1115B, which is located west and upgradient of the acid production well ECG1146, is attributed to poor quality water moving downward in the aquifer due to pumping at ECG1146. This water should eventually report to and be captured by ECG1146.

### **3.1.2 Leading Edge of Plume**

The leading edge of the sulfate plume, defined by 1,500 mg/l sulfate, has contracted substantially since 1996. Well P191B, which reached a peak measured sulfate concentration of 2,180 mg/l in 1998, now has 1,230 mg/l of sulfate (Figure 3.5). Likewise, well BSG1132A has decreased from approximately 2,400 mg/l in the late 1990s to 816 mg/l in 2004 (Figure 3.6).

Wells located close to barrier wells B2G1193 and BFG1200 generally show an increase in sulfate. Well B2G1194A located to the immediate east of the production wells has increased significantly in 2003 from 1,070 to 1,520 mg/l sulfate. However, B2G1194B has decreased in 2003 from 1,800 to 724 mg/l sulfate. Wells B2G1157A and B, located next to production well B2G1193, have increased in sulfate since the most recent sample in 2000 (A from 1,360 to 1,830 mg/l; and B from 2,530 to 4,590 mg/l). B2G1193 has increased from an average sulfate concentration of 1,635 mg/l in 2002 to 1,782 mg/l in 2003. Well BFG1155C located next to production well BFG1200 has increased significantly from 412 in 1999 to 733 mg/l in 2003. Well P277 located approximately 1,000 feet west of production well B2G1193 has increased from 1,570 to 1,750 mg/l sulfate between 2002 and 2003.

One area that calls for increased vigilance is the location of nested wells BSG1133A and BSG1133B. As shown on Figure 3.7, sulfate in the shallow A completion has decreased from 3,370 mg/l in 1996 to 1,140 in 2004. Meanwhile sulfate in BSG1133B, the deeper completion, has increased from 356 mg/l in 1996 to 2,210 in 2004. Increasing sulfate in the deeper completion may be due to downward movement of higher-sulfate water from the shallow horizon resulting from water level drawdown (Section 4.2) or changed hydrodynamics in the aquifer due to pumping. If sulfate levels continue to increase, a more thorough evaluation of this area may be necessary.

On the western margin, within the 1,500 mg/l contour, sulfate concentrations have remained relatively steady. An example of this would be ECG1152A with 2,730 mg/l in 1996 and 2,770 mg/l in 2003 (well was not sampled in 2004).

### **3.1.3 Adjacent to West Jordan Well Field**

KUCC remains watchful of sulfate concentrations around the West Jordan Well Field (wells W363, W387, and W361 shown on Figure 3.1 and W420 not shown). Heavy extraction from these wells in the 1990s caused migration of elevated-sulfate groundwater toward this area. Well W363 saw increasing sulfate throughout the 1990s (Figure 3.8). Sulfate concentrations at this location have declined since 2000 and correspond to reduced annual extraction by West Jordan and increased extraction by KUCC.

Monitoring wells located between the leading edge of the sulfate plume and the West Jordan Well field showed steady to increasing sulfate concentrations. WJG1154A located 3,400 feet south of W363 also saw elevated concentrations through the late 1990s and has shown fairly consistent sulfate concentrations through the 2004 marked by seasonal highs and lows (Figure 3.9). Sulfate in well WJG1154B, has shown a slight increase from 57 mg/l in 2001 to 91 mg/l 2004. Sulfate in monitoring well WJG1170A has been increasing steadily from 172 mg/l in 1998 to 501 mg/l in 2004 (Figure 3.10).

### **3.1.4 Discussion**

KUCC's groundwater extractions since 1997 have removed over 272,000 tons of sulfate from the alluvial aquifer in the South West Jordan Valley. The removal of this mass has resulted in declining sulfate concentrations throughout much of Zone A, especially in the core of the plume near acid extraction wells ECG1146 and BSG1201. Sulfate concentrations have increased in the area around the barrier wells B2G1193 and BFG1200, as well as in several other areas as noted above. Nevertheless, KUCC remains in compliance with the performance standard set out in the ROD of containing sulfate concentrations above 1,500 mg/l within KUCC property. KUCC remains optimistic that sulfate levels will continue to decline with ongoing extraction and mass removal and that the containment performance standard will continue to be met.

## **3.2 Aluminum**

Aluminum is elevated in the low-pH core of the acid plume. The parameter is watched because it is a significant contributor to mineral acidity and hence influences treatment strategies for acid plume water.

The distribution of aluminum in groundwater is shown on Figure 3.11. The aluminum concentration contours from 1996 and 2004 on this figure were drawn in a similar manner as the change in sulfate contour map (Section 3.1; Figure 3.1). The area outside the heavy metals plume has not had consistent sampling for aluminum and different detection limits have been reported so a change in aluminum concentration contour for values less than 1.0 mg/l is not possible. However, a line enclosing detectable aluminum in 2004 was created using wells that had any reportable aluminum.

In general, aluminum concentrations have decreased significantly since 1996. Originally in 1996 there were two distinct areas of greater than 1,500 mg/l: one on the east nose of the low pH plume at BSG1177B with a concentration of 1,550 mg/l; the other centered in the core of the low pH plume around ECG1146 (Acid Well #1). Since pumping has commenced on both acid extraction wells (ECG1146 and BSG1201), the aluminum concentration in BSG1177B has decreased to 655 mg/l eliminating the eastern area of aluminum concentrations greater than 1,500 mg/l. In the area of ECG1146 only one well, ECG1115A at 2,650 mg/l, continues to have aluminum concentrations greater than 1,500 mg/l. Decreases in aluminum concentration in the Zone A plume generally appear to mimic the decreases in sulfate concentrations.

Two areas are noted where the aluminum concentrations have increased. The aluminum concentration at ECG1128A has increased (Figure 3.12) from 428 to 937 mg/l and in well BSG1119B aluminum has increased (Figure 3.13) from 0.044 to 43 mg/l. Aluminum solubility is dependant on pH and it is thought that the rise in aluminum in well BSG1119B reflects a condition where a slight pH change greatly increased aluminum solubility.

### 3.3 Other Metals

In general, the concentrations of heavy metals have been declining in the acid plume. Specific metals including arsenic, cadmium and copper were selected for this discussion. These metals are prevalent where groundwater has a pH less than or equal to 4.5 and are monitored closely at the leading edge of the 4.5 pH plume. Production and monitoring wells located in neutral pH water generally have less than or near the detection limit concentrations of arsenic, aluminum, cadmium, and copper.

Arsenic concentrations are generally declining in the low pH plume core and core perimeter. Overall changes, increasing or decreasing, are relatively small, usually less than 0.010 mg/l. The exception to this small change includes the following wells, all of which show decreasing arsenic from 2003 to 2004: ECG1146 (0.047 to 0.034 mg/l), ECG1115A (0.063 to 0.020 mg/l), ECG1115C (0.088 to 0.020 mg/l), ECG1121A (0.034 to 0.024 mg/l), and BSG1180B (0.063 to 0.046 mg/l). Arsenic increased from 0.035 to 0.042 mg/l in well BSG1177B located adjacent to acid extraction well BSG1201.

Cadmium concentrations in the low pH plume are varied and generally decreasing. Most changes between 2003 and 2004 are less than 0.10 mg/l. The decreasing exceptions to this small change includes BSG1177A (1.40 to 1.18 mg/l), BSG1177B (2.08 to 1.90) mg/l and P279 (0.468 to 0.388 mg/l). Increasing exceptions (changes greater than 0.100 mg/l) include BSG1119B at the leading edge of the low pH plume (0.531 to 0.646 mg/l) and ECG1145 (1.30 to 1.50 mg/l). Production Well ECG1146 also saw a small increase from 0.884 to 0.900 mg/l.

Copper concentrations also are generally decreasing in the low pH plume. Changes between 2003 and 2004 are generally less than 1.0 mg/l. Those wells showing decreasing changes greater than 1.0 mg/l include: B1G951 (located adjacent and down gradient from

the Large Bingham Reservoir; 58.3 to 52.4 mg/l), BSG1177B (53.8 to 43.3 mg/l), BSG1179C (72.9 to 71.6 mg/l), ECG1117A (46.4 to 43.3 mg/l), ECG1121A (49.6 to 47.6 mg/l), ECG1144A (38.1 to 35.4 mg/l), ECG1145A (37.5 to 34.5 mg/l), acid extraction well ECG1146 (99.3 to 98 mg/l), and SRG946 (located down gradient and adjacent to the Small Bingham Reservoir; 68.5 to 60.8 mg/l). Wells showing an increase of greater than 1.0 mg/l copper include: ECG1115A (149 to 152 mg/l), ECG1115C (9.5 to 26.0 mg/l), and P279 (62.0 to 63.4 mg/l).

In the leading edge of the low pH plume, BSG1119B shows a small increase of 0.056 to 0.064 mg/l. Other wells showing decreases or increases in the 0.100 mg/l range for copper are not considered significant enough for further discussion.

### 3.4 pH

In general, pH values within Zone A have not changed dramatically, unlike sulfate or aluminum. However, this response was predicted by test work conducted for the RI (KUCC 1998). Current groundwater pH is illustrated graphically on Figure 3.14. This map shows the pH contours for 2004 and highlights areas where there has been a change, albeit minor, in pH since the previous measurement that has caused the contour line for a given interval to shift. Specific portions of the low-pH plume are discussed below.

#### 3.4.1 Plume Core

There were 38 wells that were sampled in 2004 that had a pH less than 4.5, which defines the plume core. Sixteen of these samples had a pH slightly less than the previous sample. Those samples with a higher pH than the most recent sample were for the most part only slightly higher. Exceptions are wells ECG1156B and C located 1,500 feet northwest of acid extraction well ECG1146. Well ECG1115B water decreased (Figure 3.15) in pH from 6.9 in 2001 to 5.9 in 2004 and ECG1115C decreased (Figure 3.16) in pH from 4.1 in 2003 to 3.6 in 2004. Lowering of the water table in the vicinity of ECG1115 due to pumping of ECG1146 could be driving the poorer quality water to deeper depths resulting in the lower pH in the B and C completions.

Water from well ECG1124B, located next to ECG1146, has increased (Figure 3.17) in pH from 3.1 in 1995 to 4.1 in 2004. The ECG1124 A and C completions have remained relatively stable during this time period. Water from well ECG1145A has increased steadily (Figure 3.18) in pH from 3.3 in 1996 to 3.7 in 2004. This well is located only 500 feet southwest of acid extraction well ECG1146 and has no doubt been affected by pumping.

#### 3.4.2 Leading Edge of Plume

Samples collected in 2004 from wells located on the eastern leading edge of the plume have changed little in pH; however, more wells have decreased than increased. A few exceptions are BFG1156B, C and D located between KUCC production wells BFG1200 and B2G1193. BFG1156B has decreased from 7.2 in 2003 to 6.9 in 2004, BFG1156C

has decreased from 7.2 in 2003 to 7.0 in 2004 and BFG1156D has decreased from 7.5 in 2003 to 7.1 in 2004.

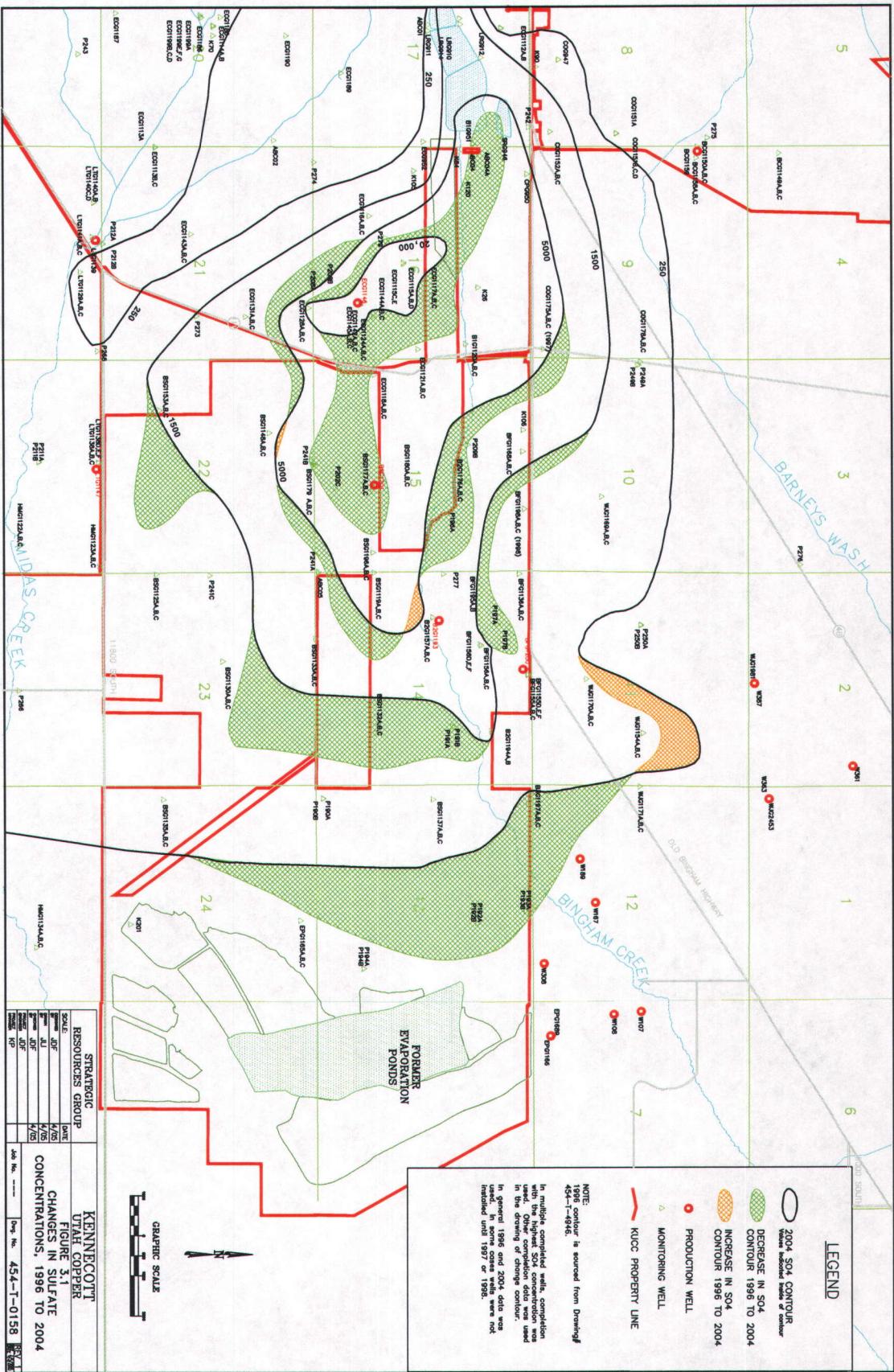
There were four 2004 samples collected from wells near the southeast leading edge of the plume. Three of these samples had a lower pH than the previous sample: BSG1130A (7.5 in 2003 to 7.2 in 2004), P241C (7.2 in 2003 to 7.0 in 2004), and BSG1148B (7.5 in 2002 to 7.3 in 2004). The pH of BSG1148A has been steadily decreasing (Figure 3.19) from a high of 7.4 in 1996 to 6.8 in 2004. Although this drop is not great, the steady decline in pH values suggests a true change in water quality at this location.

Water from well ECG1128A has decreased (Figure 3.20) in pH from 5.5 in 1995 to 3.6 in 2004. However, most of the change occurred between 1995 and 2002, and the pH has remained relatively constant between 2002 and 2004.

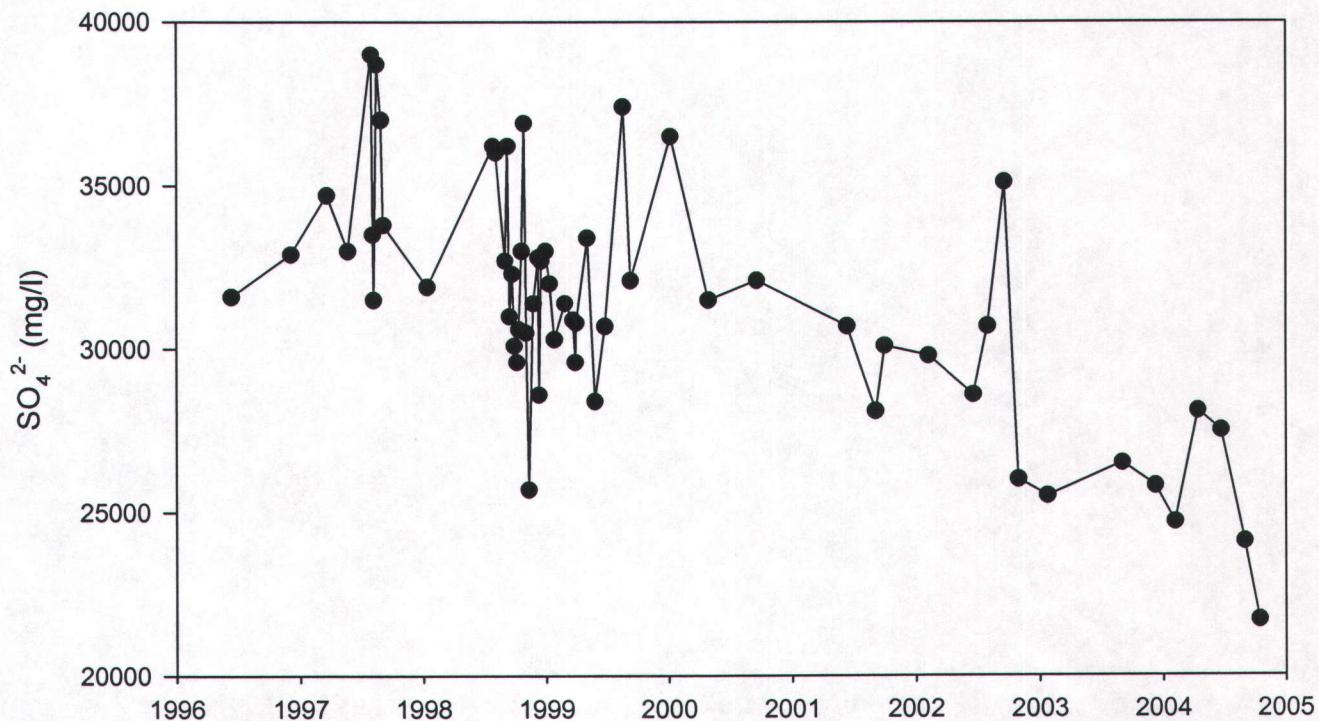
Four 2004 samples from wells bordering the West Jordan well field decreased in pH compared to the most recent 2003 sample. These wells are WJG1169A and B, and WJG1154A and B. These decreases are generally small with the largest decrease at less than 0.22 standard pH units. Two other West Jordan well field border wells increased in 2004: WJG1170A from 6.9 in 2003 to 7.3 in 2004 and WJG1171A from 7.2 in 2003 to 7.6 in 2004.

### 3.5 Discussion

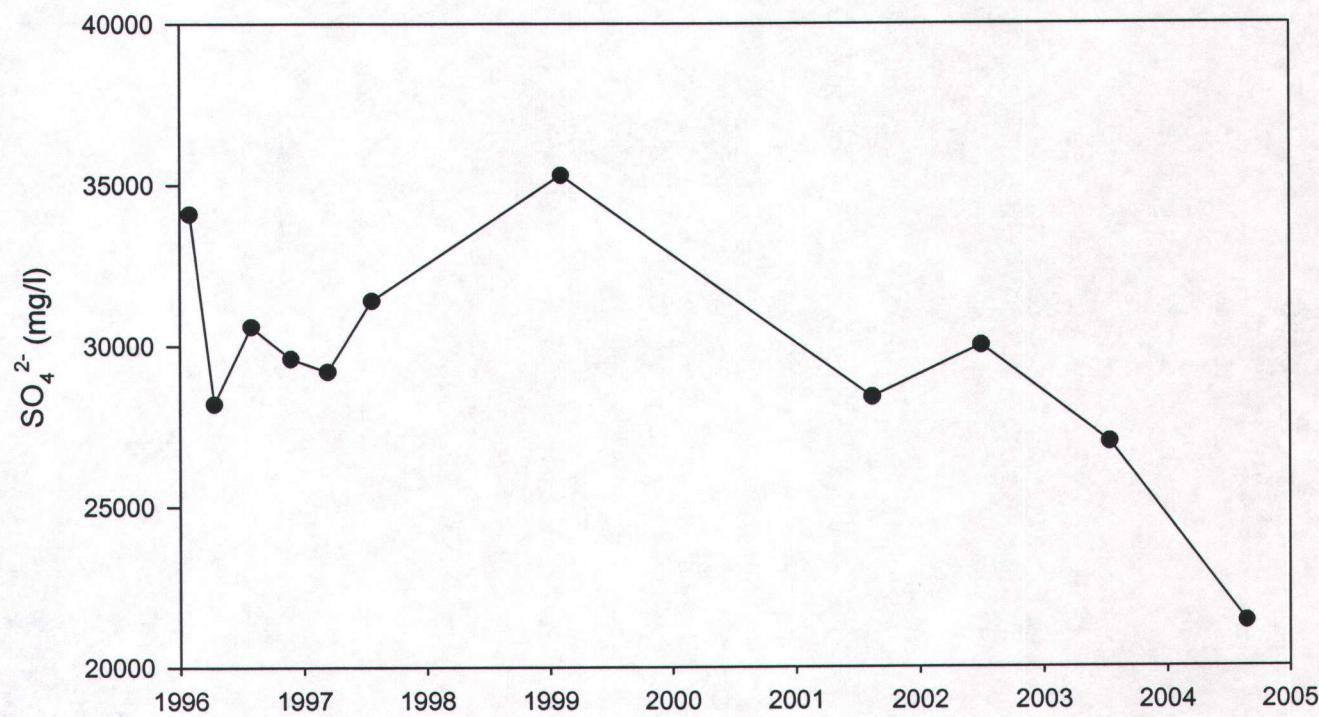
As noted above, it was predicted that pH would respond more slowly than sulfate or metals to remedial extraction. Column test work (RI Section 5.2.1; KUCC, 1998), indicates that hydrogen ions slowly desorb from amorphous iron hydroxide found in the aquifer matrix and result in a prolonged generation of low-pH water as clean water moves into the aquifer. The 2003 – 2004 data do not indicate any changes to understanding of the system and are considered to be consistent with the rest of the observed aqueous chemistry.



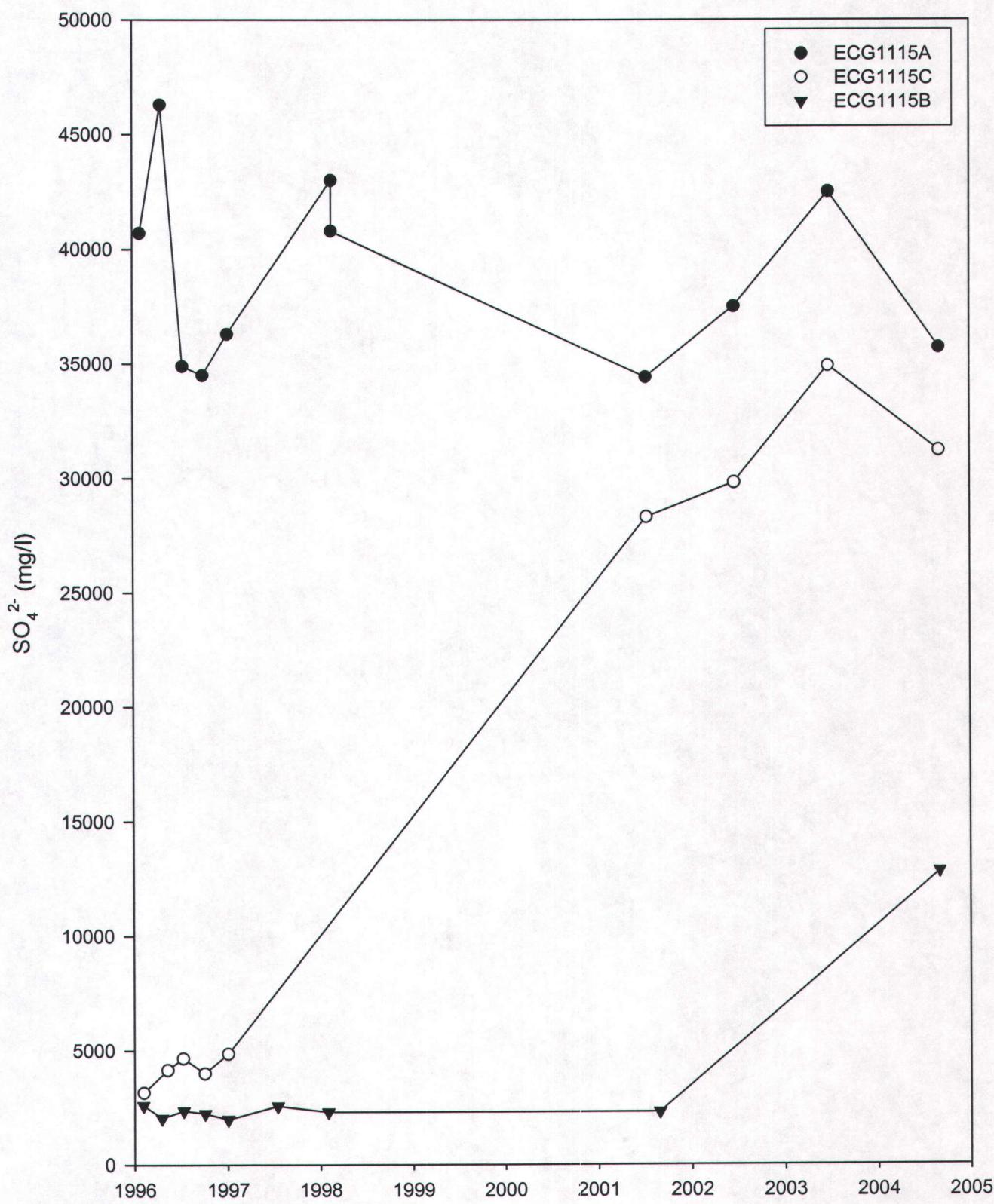
**Figure 3.2 Well ECG1146 Sulfate Concentration**



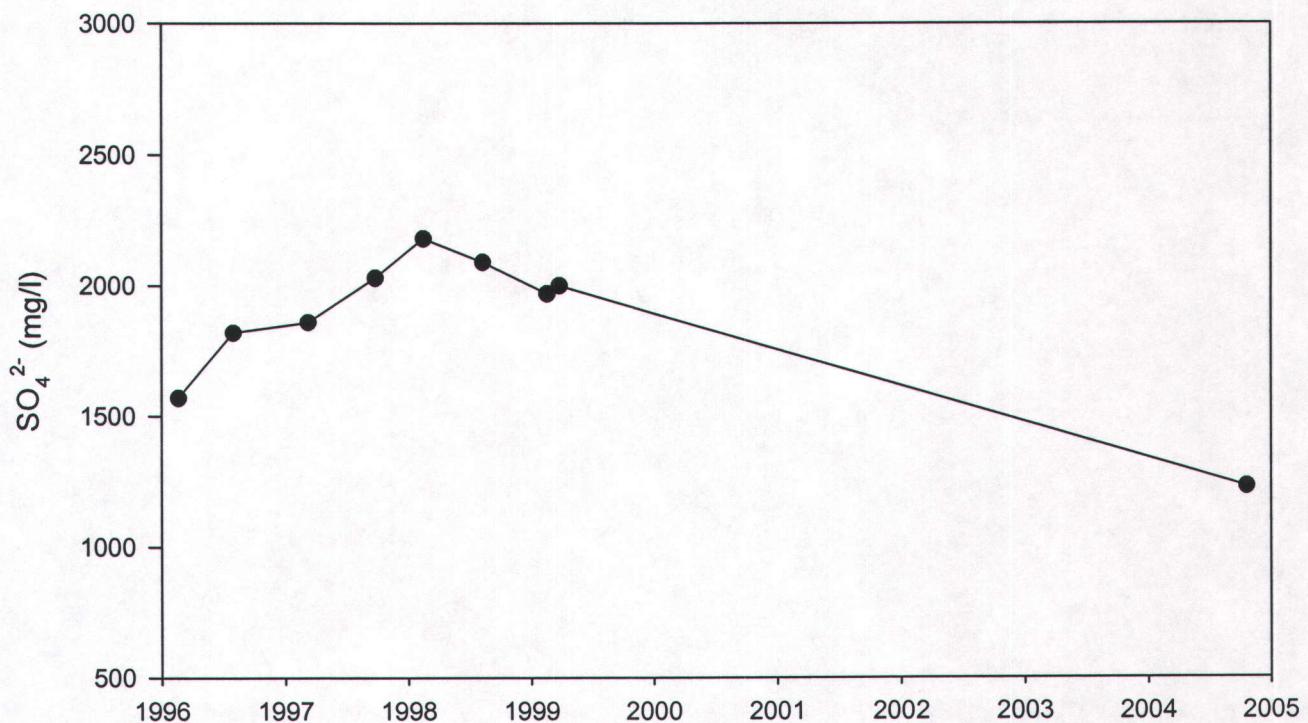
**Figure 3.3 Well ECG1128A Sulfate Concentration**



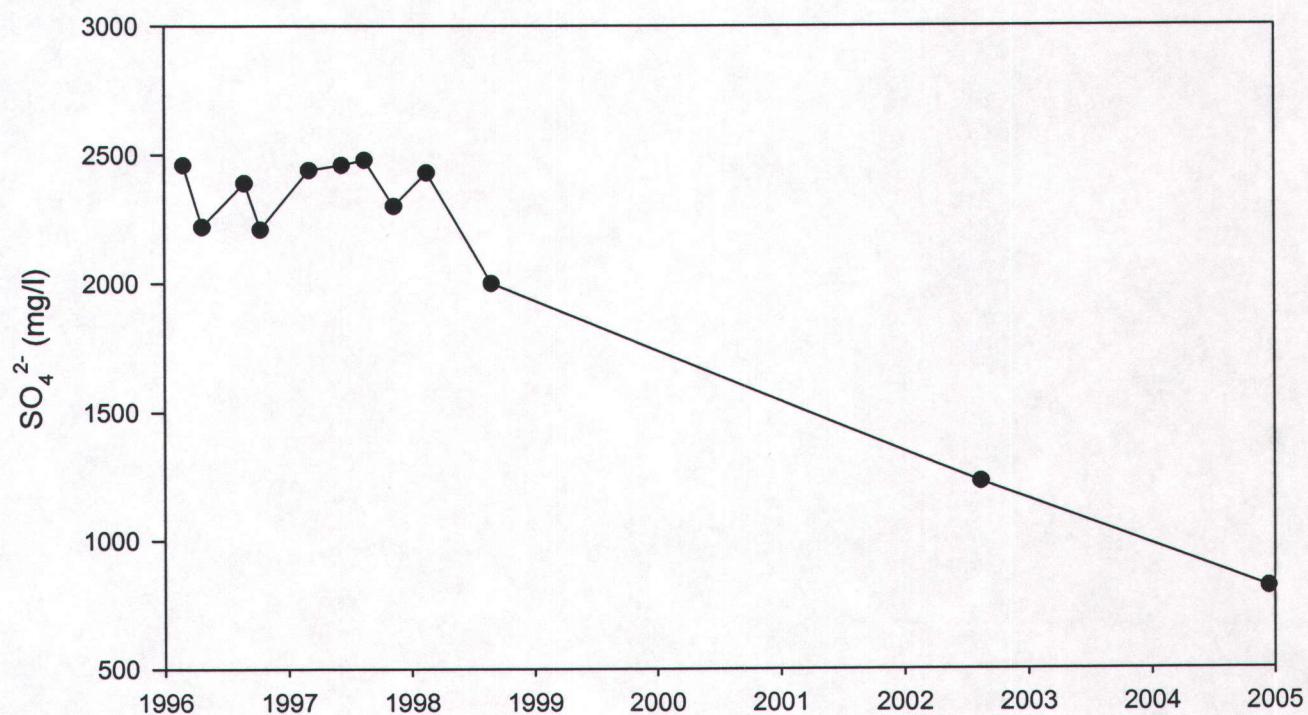
**Figure 3.4 Wells ECG1115A, B, and C Sulfate Concentrations**



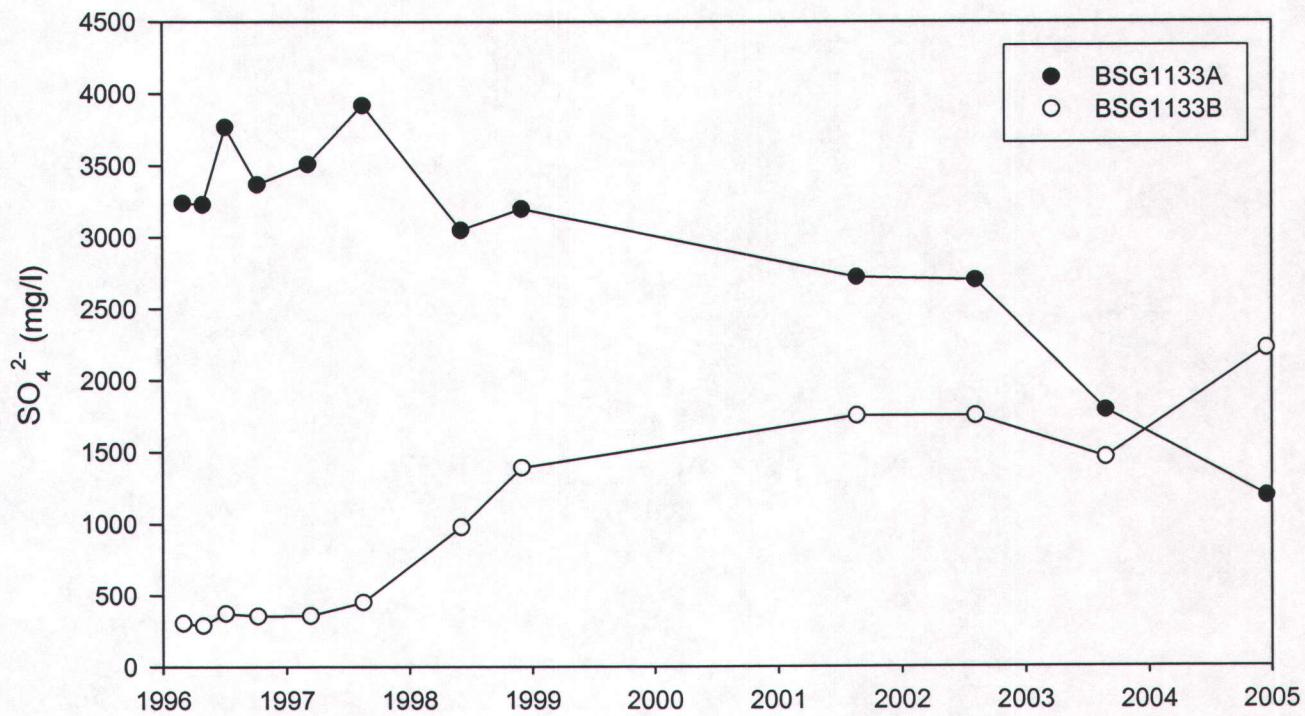
**Figure 3.5 Well P191 Sulfate Concentration**



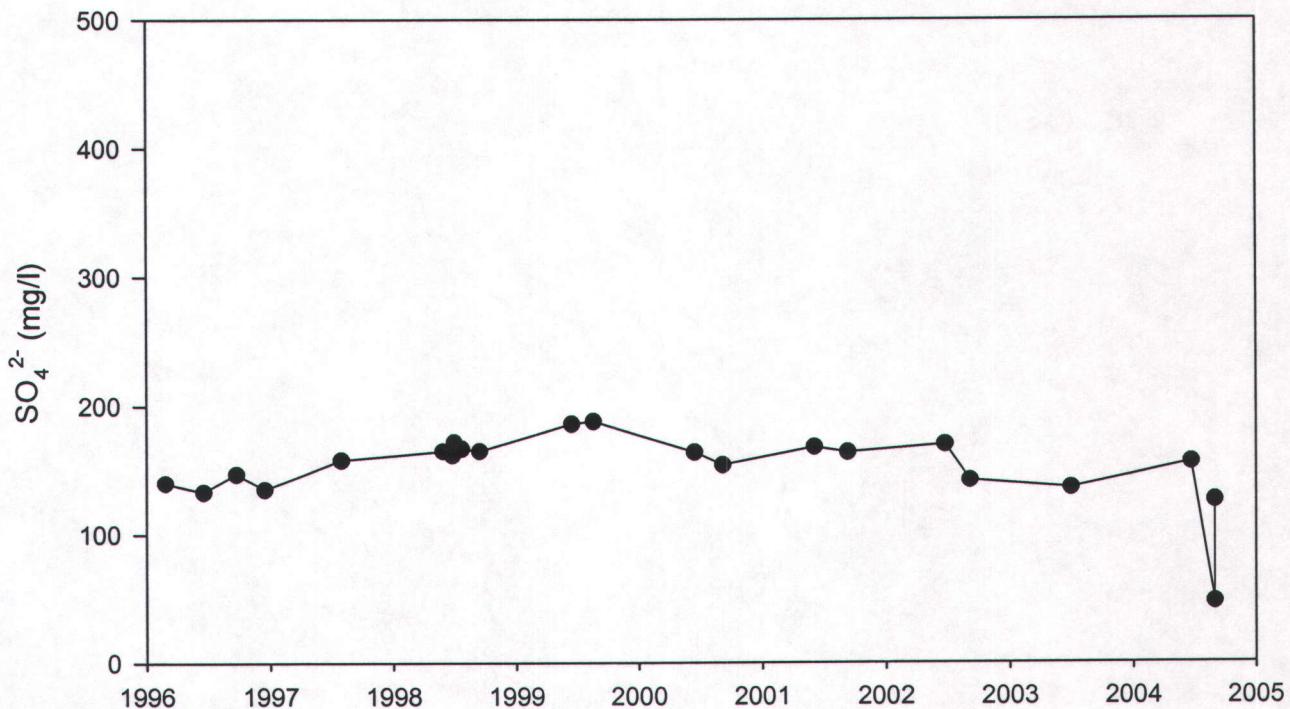
**Figure 3.6 Well BSG1132A Sulfate Concentration**



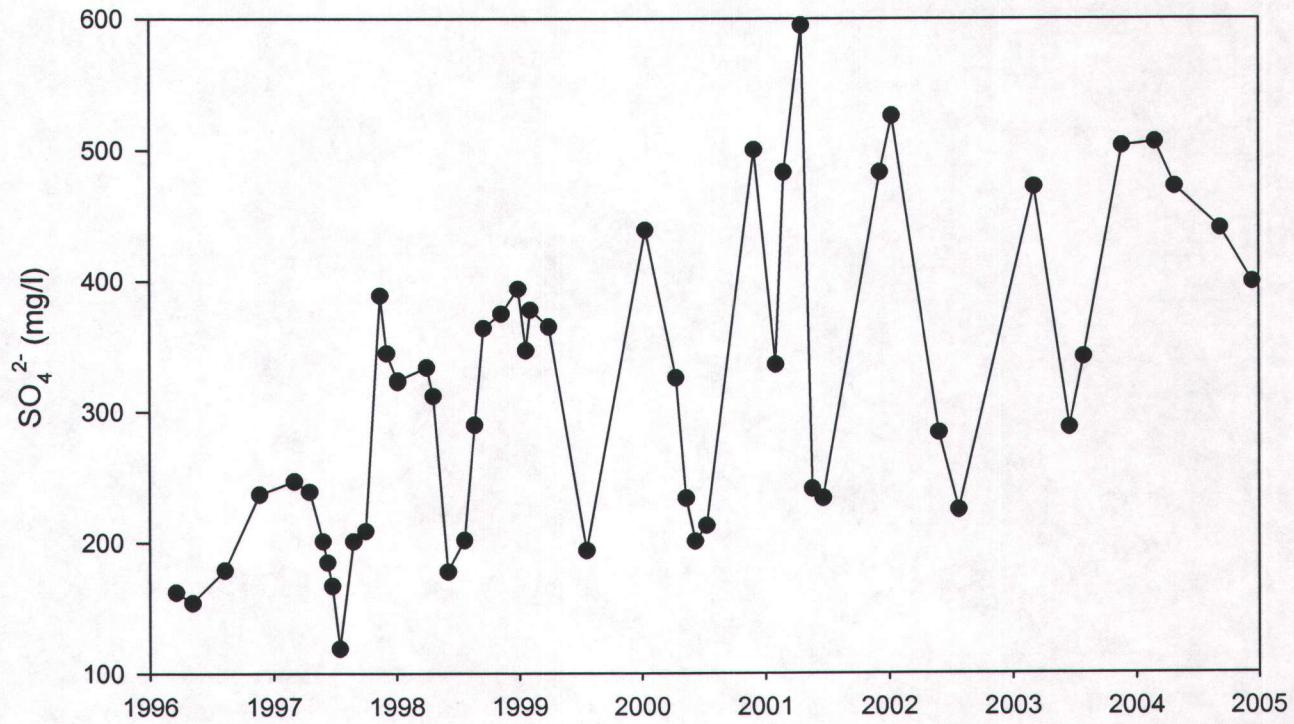
**Figure 3.7 Wells BSG1133A and B Sulfate Concentrations**



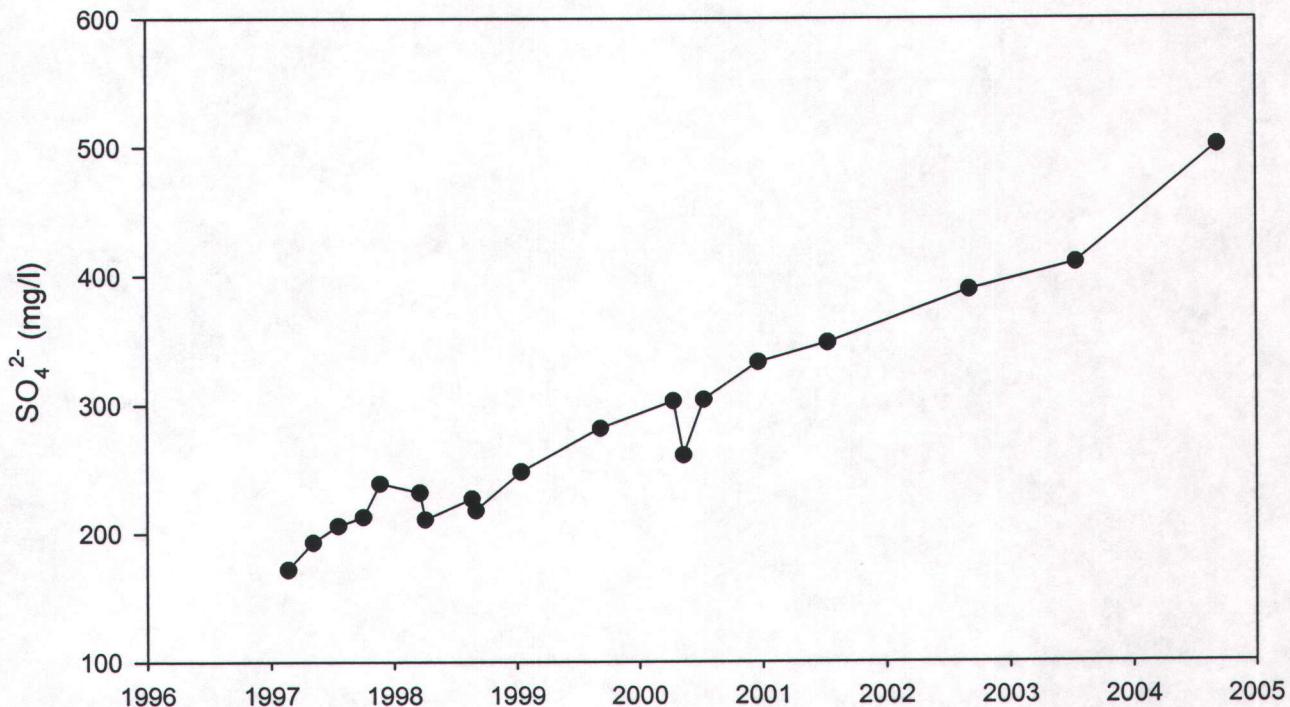
**Figure 3.8 Well W363 Sulfate Concentration**

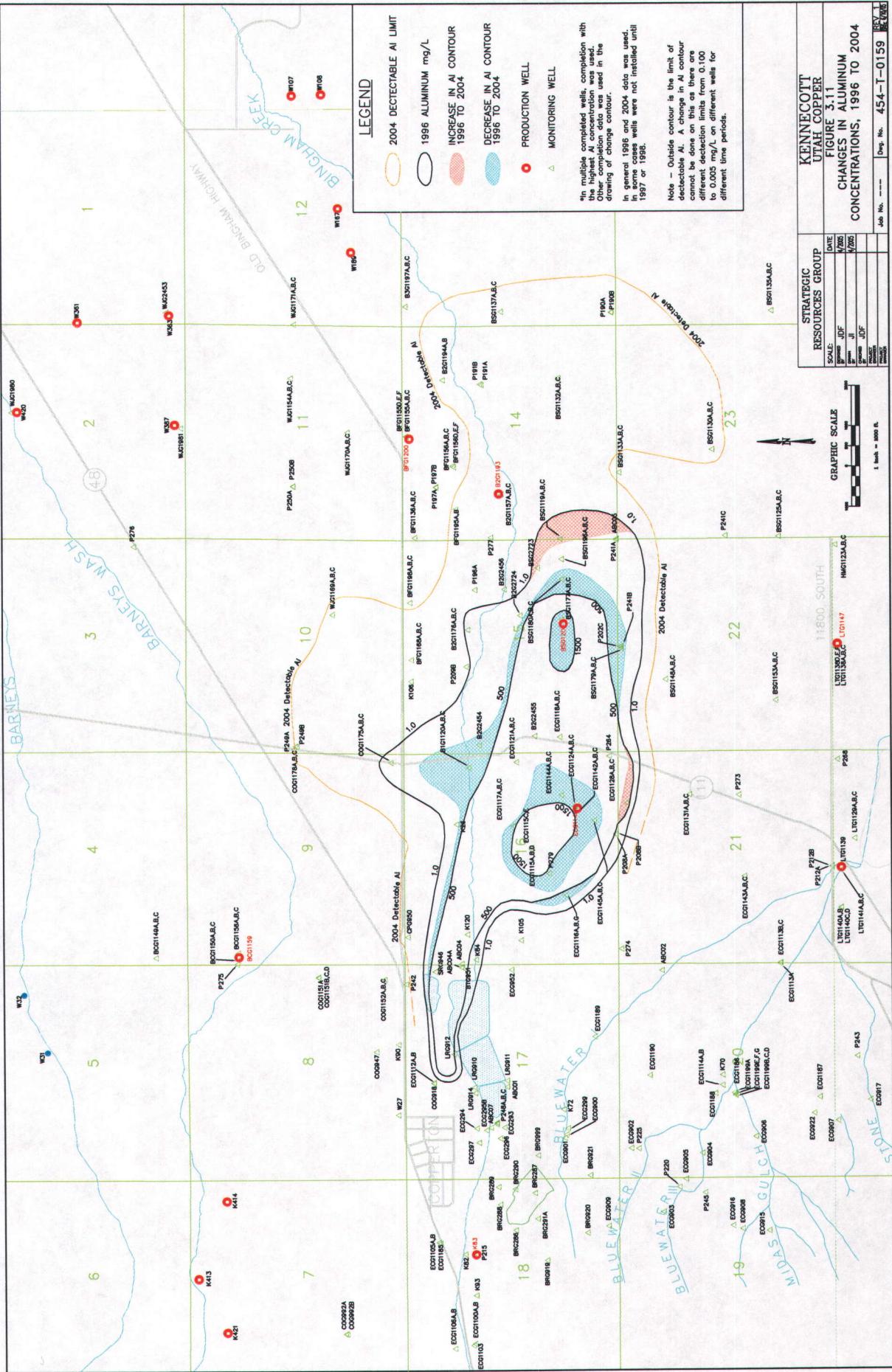


**Figure 3.9 Well WJG1154A Sulfate Concentration**

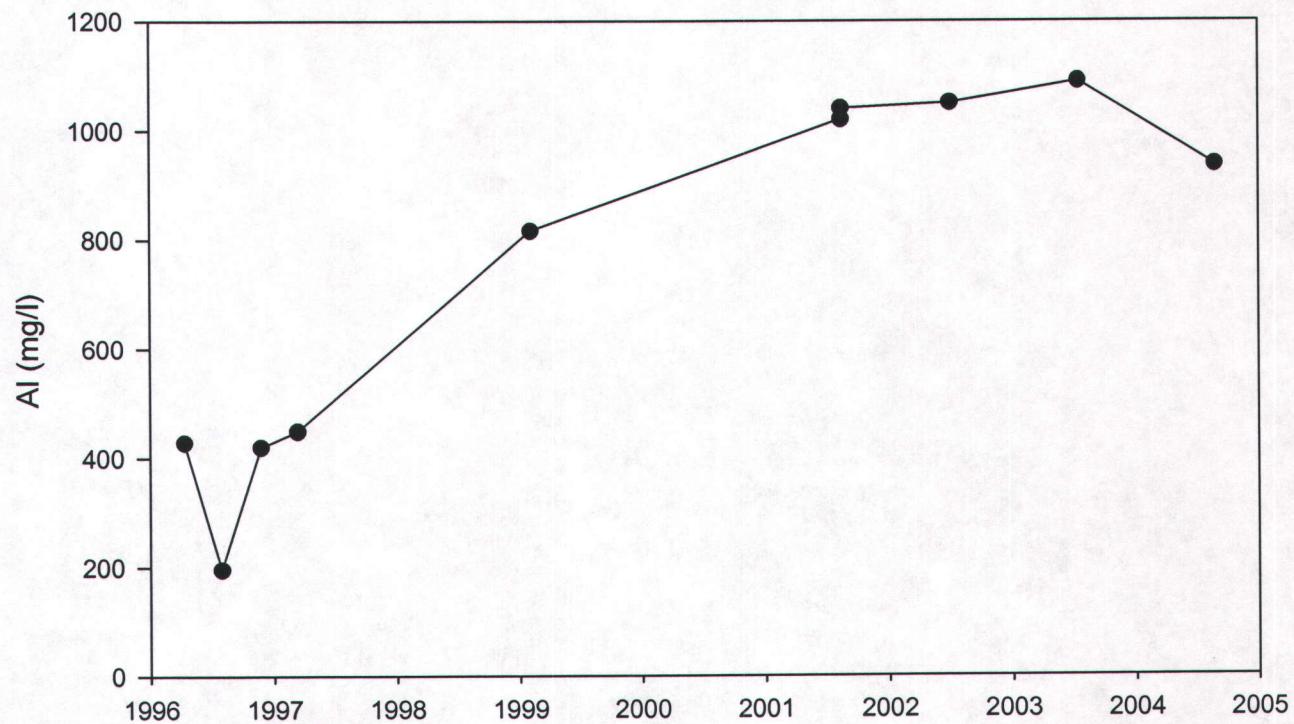


**Figure 3.10 Well WJG1170A Sulfate Concentration**

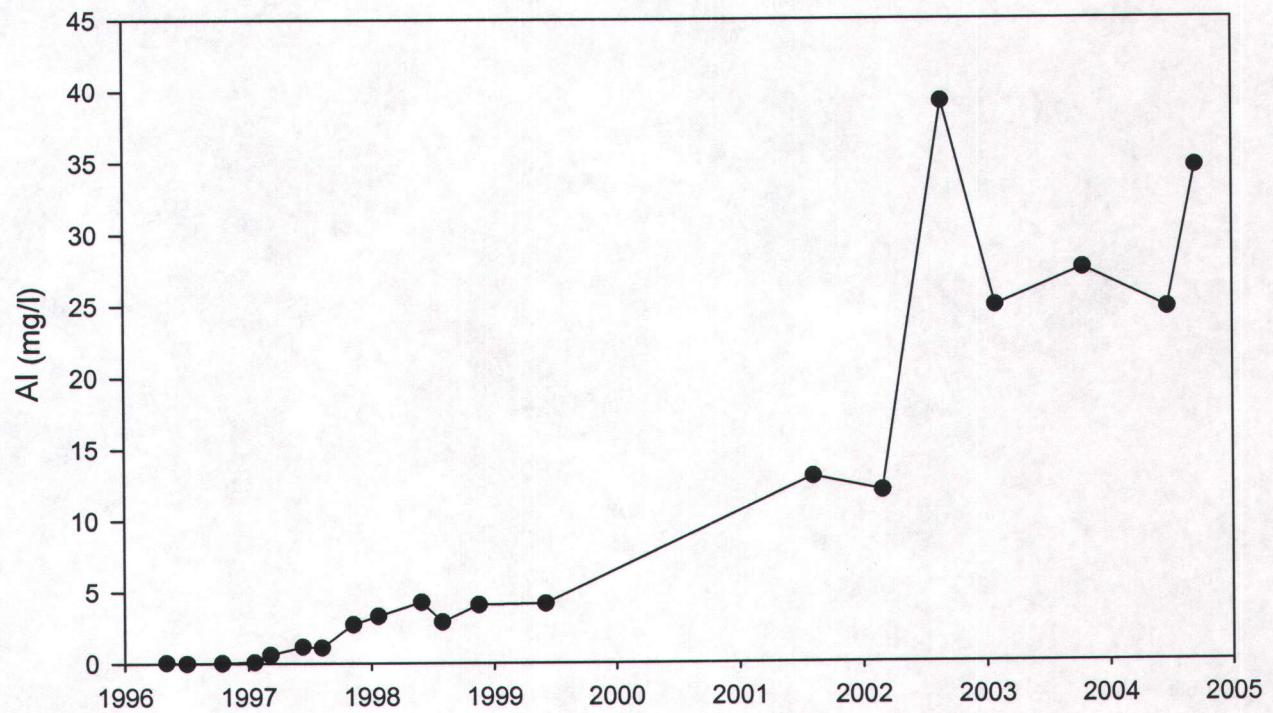


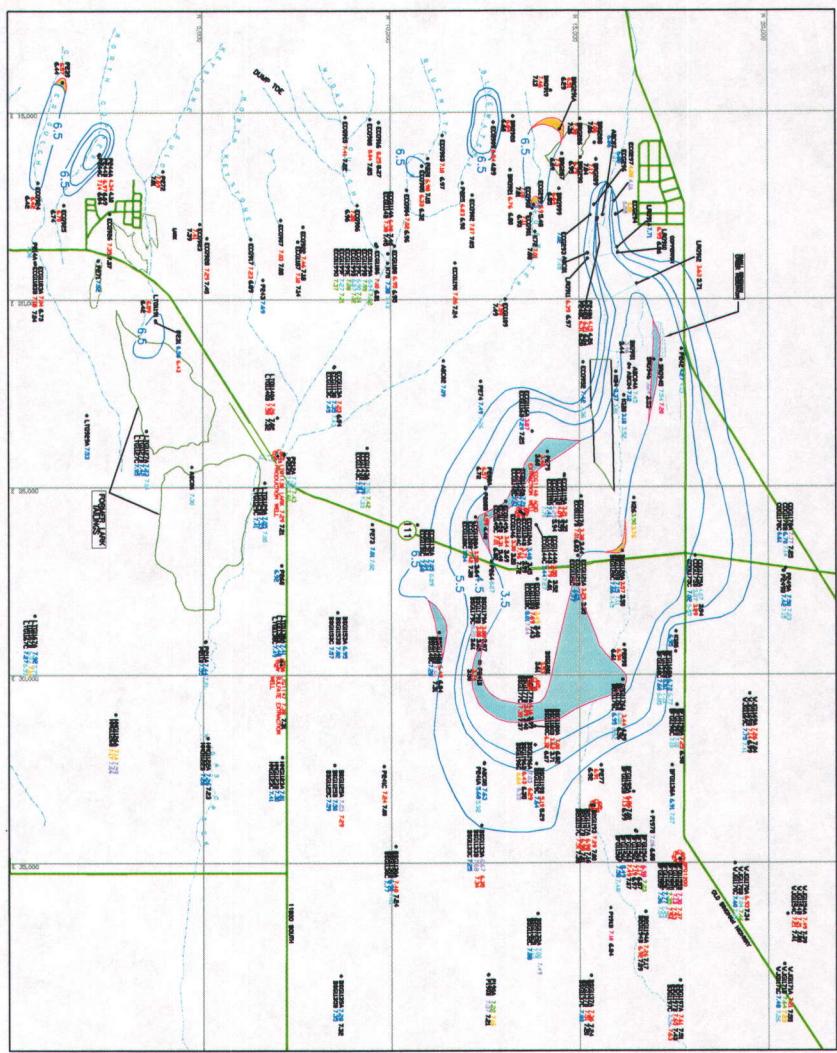


**Figure 3.12 Well ECG1128A Aluminum Concentration**

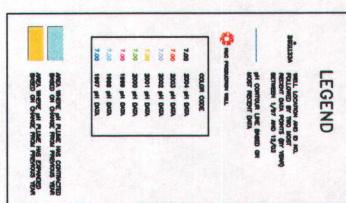


**Figure 3.13 Well ECG1119B Aluminum Concentration**





**LEGEND**



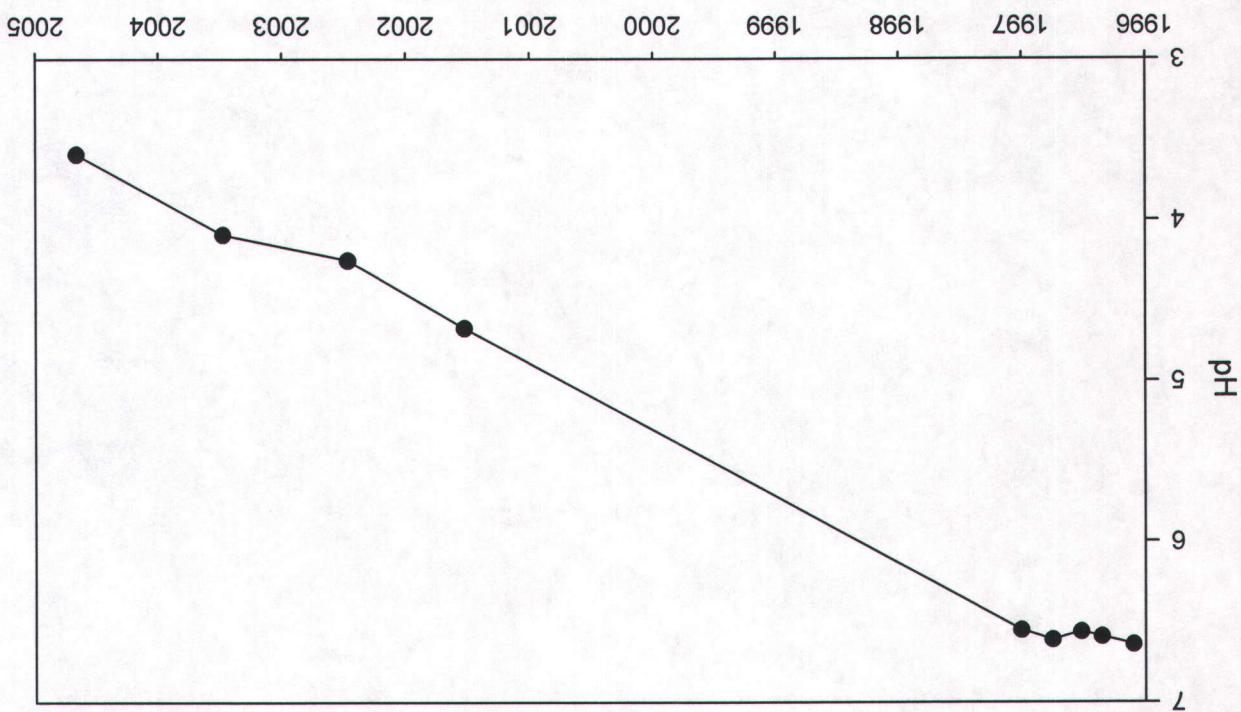


Figure 3.16 Well ECG115C pH

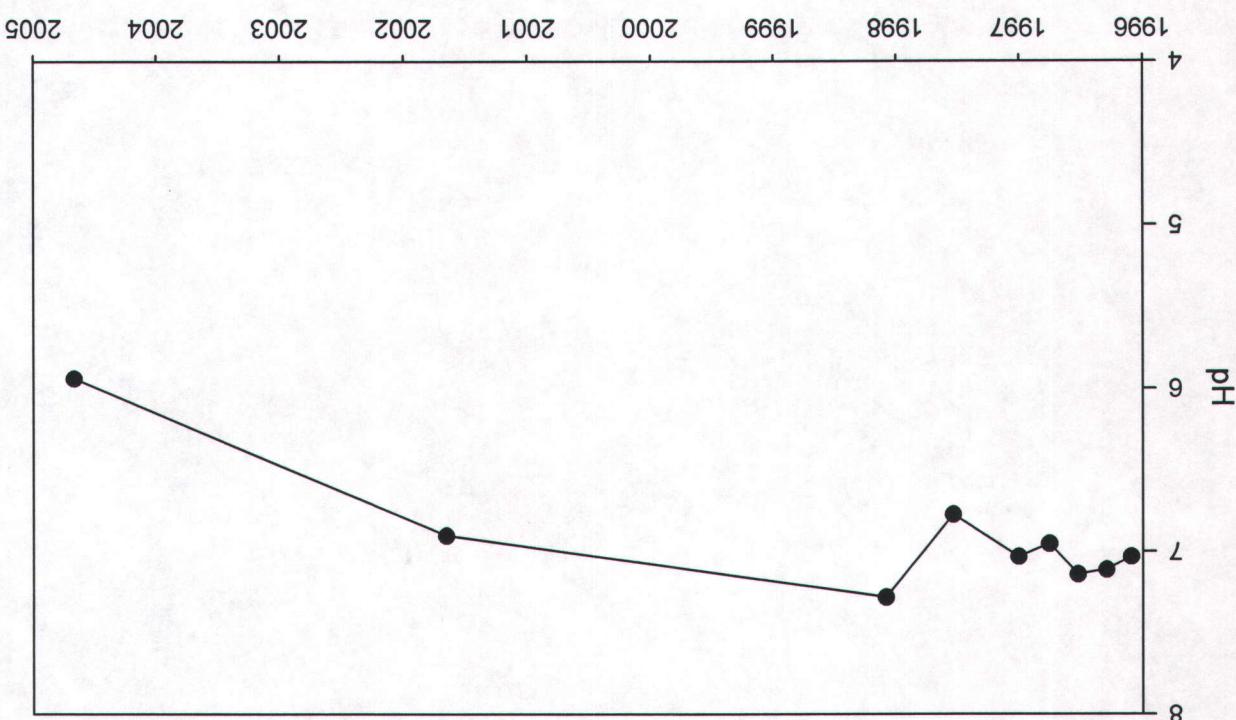


Figure 3.15 Well ECG115B pH

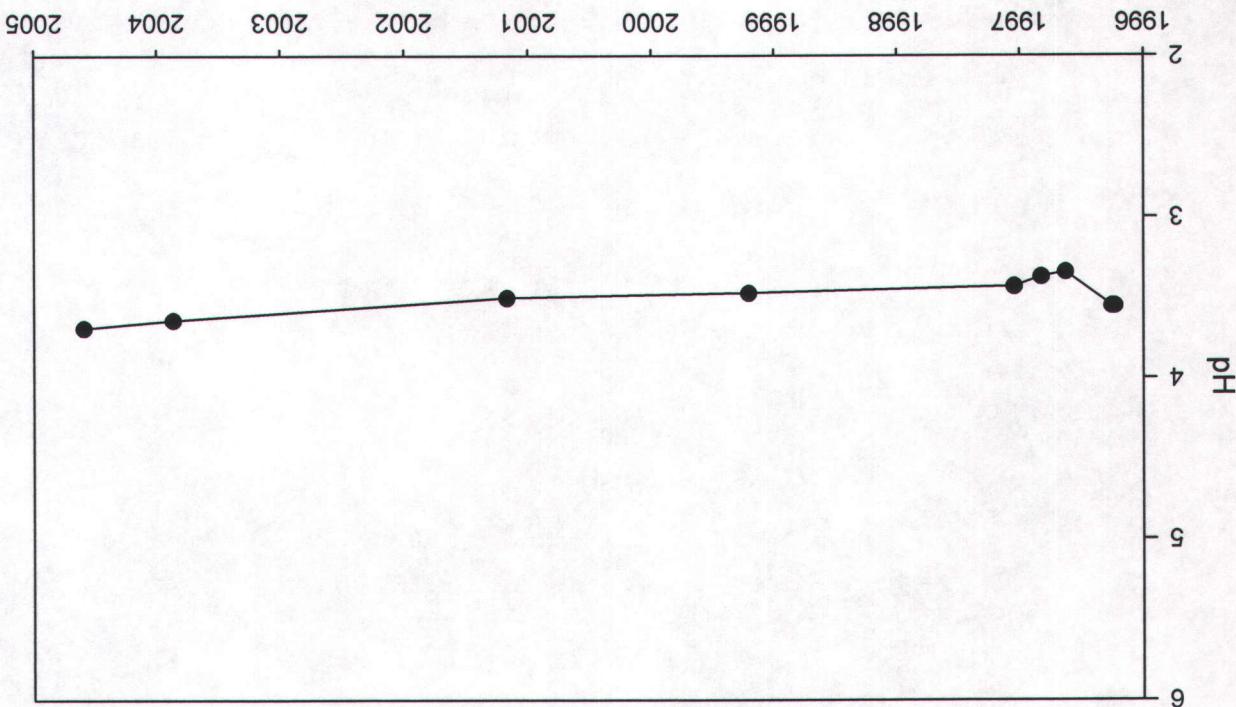


Figure 3.18 Well ECG1145A pH

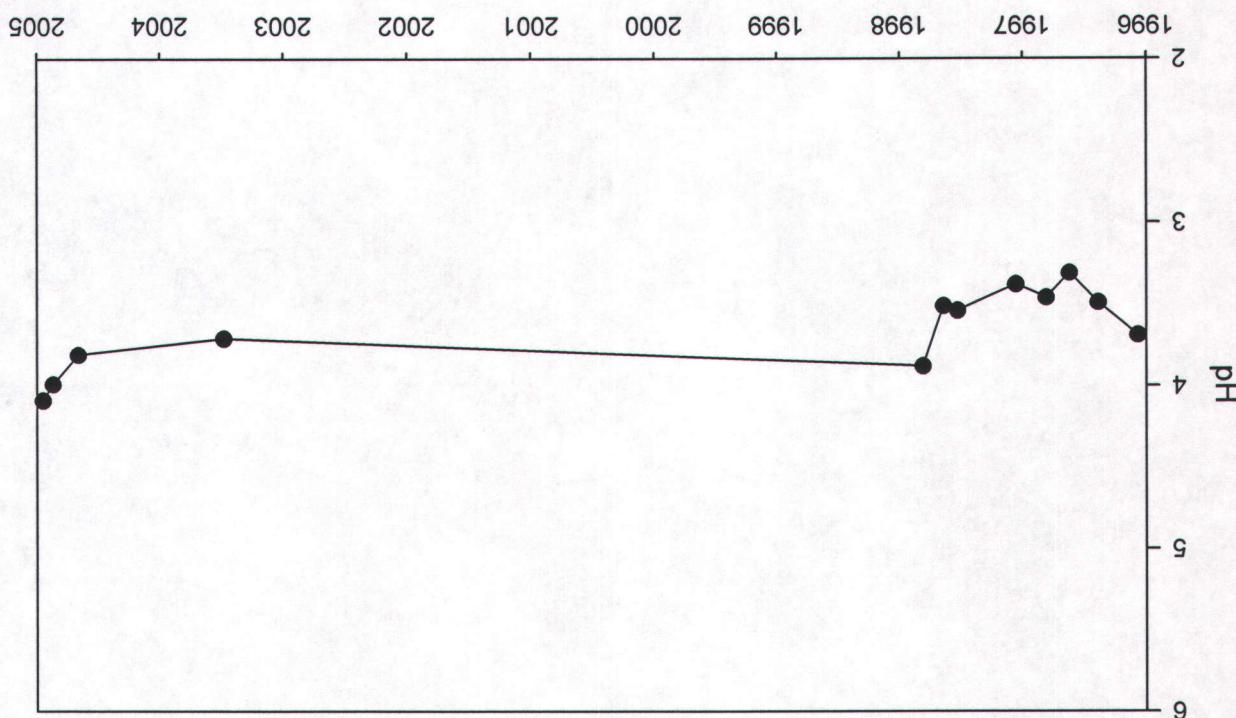


Figure 3.17 Well ECG1124B pH

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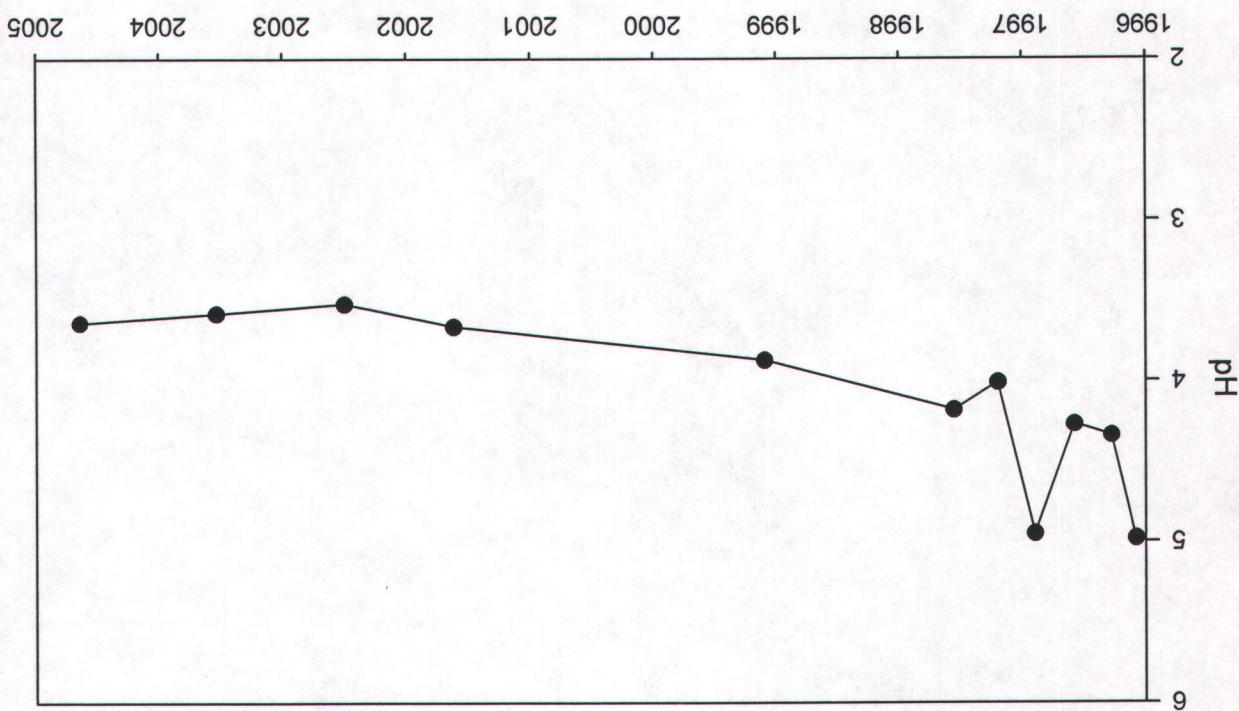


Figure 3.20 Well ECG1128A pH

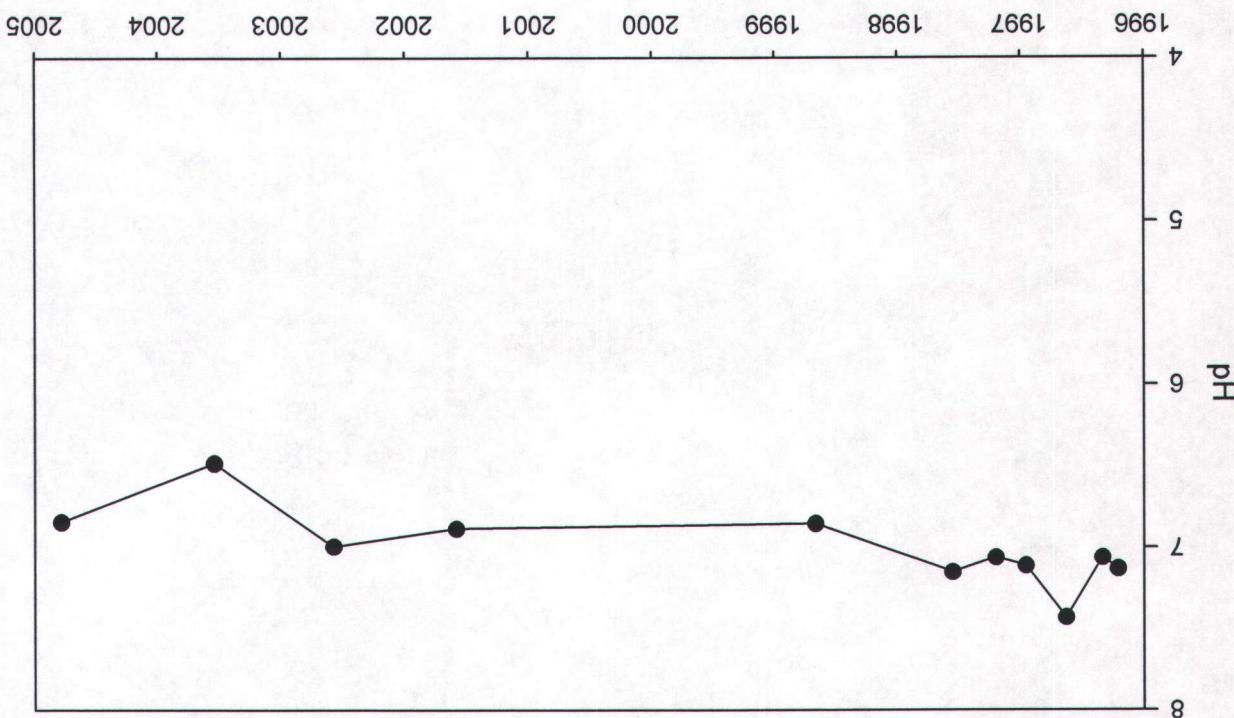


Figure 3.19 Well BSG1148A pH

Twenty of the 27 wells that showed an increase in the depth to water between April 2003 and April 2004 are located just to the east of the waste rock piles with the majority of these wells located in the Dark area. The remaining seven wells are scattered across the investigation area with two in Hermiman, two near the former Evaporation Ponds site and three in the vicinity of the clean water well LG1139.

Level between April 2003 and April 2004. One hundred twenty-two of these wells show a drop in the water within the study area. One hundred single completion wells and the first completion or highest elevation of nested wells were 149 wells monitored in both April 2003 and April 2004. These wells are the single completion wells and the first completion or highest elevation of nested wells within the study area.

#### 4.2.1 April 2003 to April 2004

Changes in water levels for the April 2004 and September 2004 measuring events compared to the previous year are shown on Figures 4.3 and 4.4.

#### 4.2 Water-Table Changes

Water-table elevation data are presented on Figure 4.1 for April 2004 and Figure 4.2 for September 2004. The water-table gradient in the southwesterly Jordan Valley drops steeply from the east side mine waste-rock dumps eastwardly, to approximately 2000 feet east of Highway 111. The water-table shows an abrupt flattening from there to approximately 3000 feet to the east, and then becomes steep again to the easting of the KUCC production wells. The gradient is again flatter from the production wells east to the KUCC property line. Variations in the water table due to production well pumping are observed locally.

#### 4.1 Groundwater Gradient

The April measurements are taken before seasonal pumping of non-KUCC production wells begins. The September measurements show water levels at the end of the irrigation season but while large production wells in surrounding communities were still pumping. Water level monitoring data are reported in Appendix B.

1. Annual monitoring of all wells (occurs in September)
2. Springtime monitoring of shallow completions (occurs in April)
3. More-frequent monitoring around pumping wells.

The RDRA Monitoring Plan (KUCC 2002, Section 3.2.3) designates 317 wells for water level monitoring according to the following schedule:

KUCC gathers water level data to 1) assess groundwater gradients and flow paths, which are used in ongoing planning and evaluation, and 2) assess the effects of groundwater extraction on water table elevation.

#### 4. GROUNDWATER ELEVATION

water level changes between September 2003 and September 2004 are similar to the changes observed from April 2003 to April 2004; however, the water table drops are much greater. Decreases up to 30 feet were recorded in the immediate vicinity of sulfate extraction wells LTG1147 and the clean water production well LTG1139 and decreases of 15 and 14 feet in acid extraction wells ECG1146 and BSG1201, respectively. On the north, the zone of influence of the Kemencott production wells BFG1200 and B2G1193 has deepened slightly particularly in the area to the immediate east and southeast of these wells. Drawdown in this area is also attributed to summer-time pumping by West Jordan.

Two hundred thirty-five of these wells show a drop in the water level between September 2003 and 2004. These were 282 wells monitored in both September 2003 and September 2004. These include most of the wells in the study area including all completions of nested wells. Three were 282 wells monitored in both September 2003 and September 2004. The water table has dropped up to 6 feet. These decreases are localized and are generally defined by only two to three wells. These may be a result of the cessation of leaching operations in October 2000.

There are two smaller areas located to the immediate east of the waste rock piles where the water table has dropped to the clean water production well LTG1139 located near the intersection of State Highway 111 and 11800 South. The zone of influence of this well is approximately 1000 feet by 3000 feet. There is a small drop (3 feet) in the water table as a result of pumping from the clean water production well LTG1139 located near the intersection of State Highway 111 and 11800 South. The zone of influence of this well is approximately 1000 feet by 3000 feet.

Pumping from acid extraction well ECG1146, located to the west of acid extraction well BSG1201 has dropped the water table approximately 2 to 8 feet over an area covering approximately 6500 feet north-south by 3000 feet east-west. The area seeing water table decline influenced by this well roughly mimics the potentialometric contours of 4,850 and 5,000 as shown on Figure 4.1. Pumping from acid extraction well ECG1146, located to the west of acid extraction well BSG1201, and the West Jordan wells. This decline roughly mimics the area between the 4,600 and 4,650 potentialometric contour shown on Figure 4.1.

Decreases in the water table of between 1 to 4 feet extend approximately 27,000 feet south from the West Jordan Well Field north-most well, W420, to monitoring well W131A. This area is influenced by the pumping of the Kemencott production wells B3G1193, BFG1200, and the West Jordan wells. This decline roughly mimics the area between the 4,650 and 4,750 potentialometric contour shown on Figure 4.1.

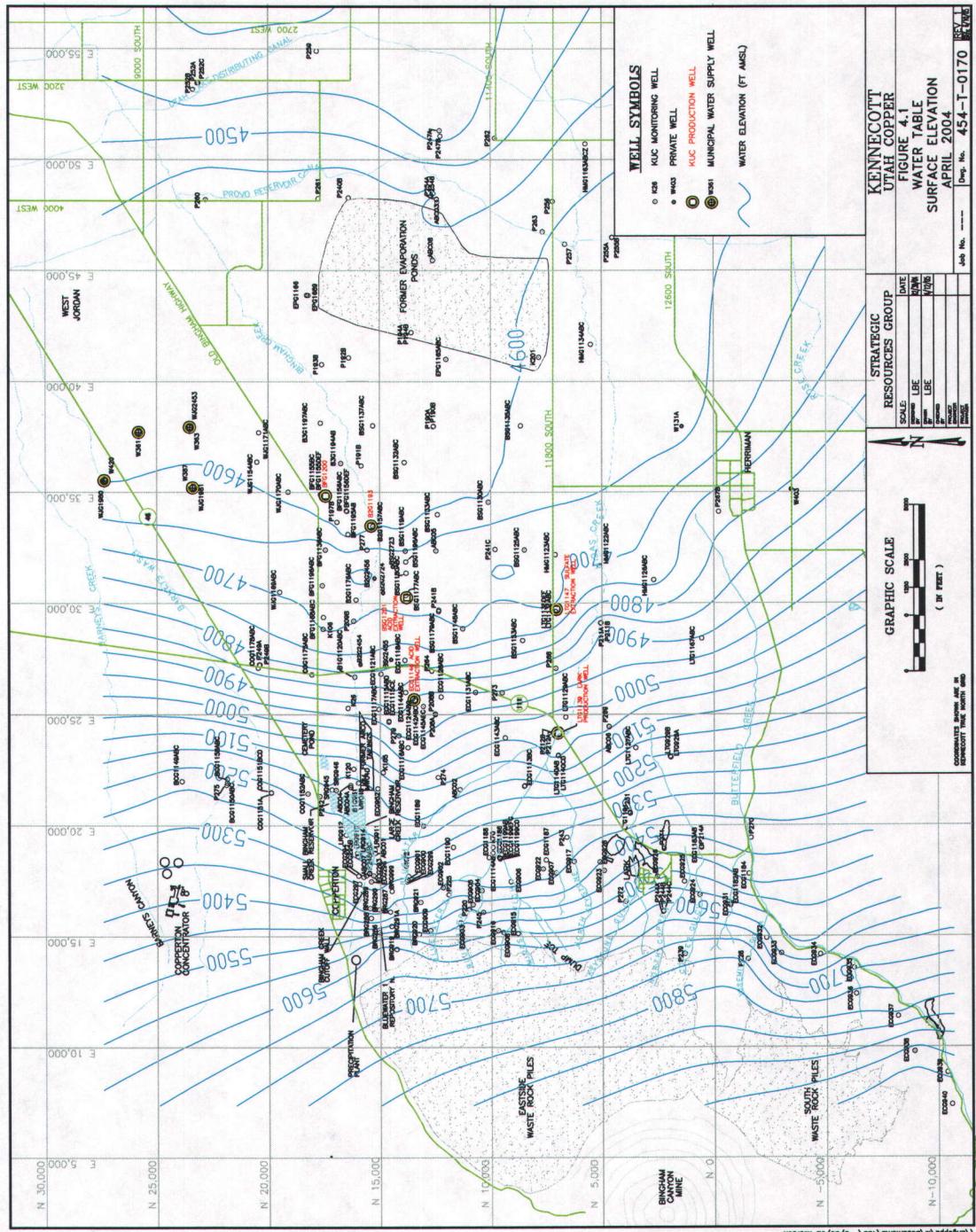
These two wells covers an area that is approximately 17,000 feet north - south between WJG1169 on the north and HMG1126 on the south and 4,000 to 5,000 feet east to west. The largest water level drops (> 10 feet) are in wells located in the vicinities of production wells LTG1147 and BSG1201. The zone of water level decline from the pumping of these two wells covers an area that is approximately 17,000 feet north - south between roughly mimicking the area between the 4,650 and 4,750 potentialometric contour shown on Figure 4.1.

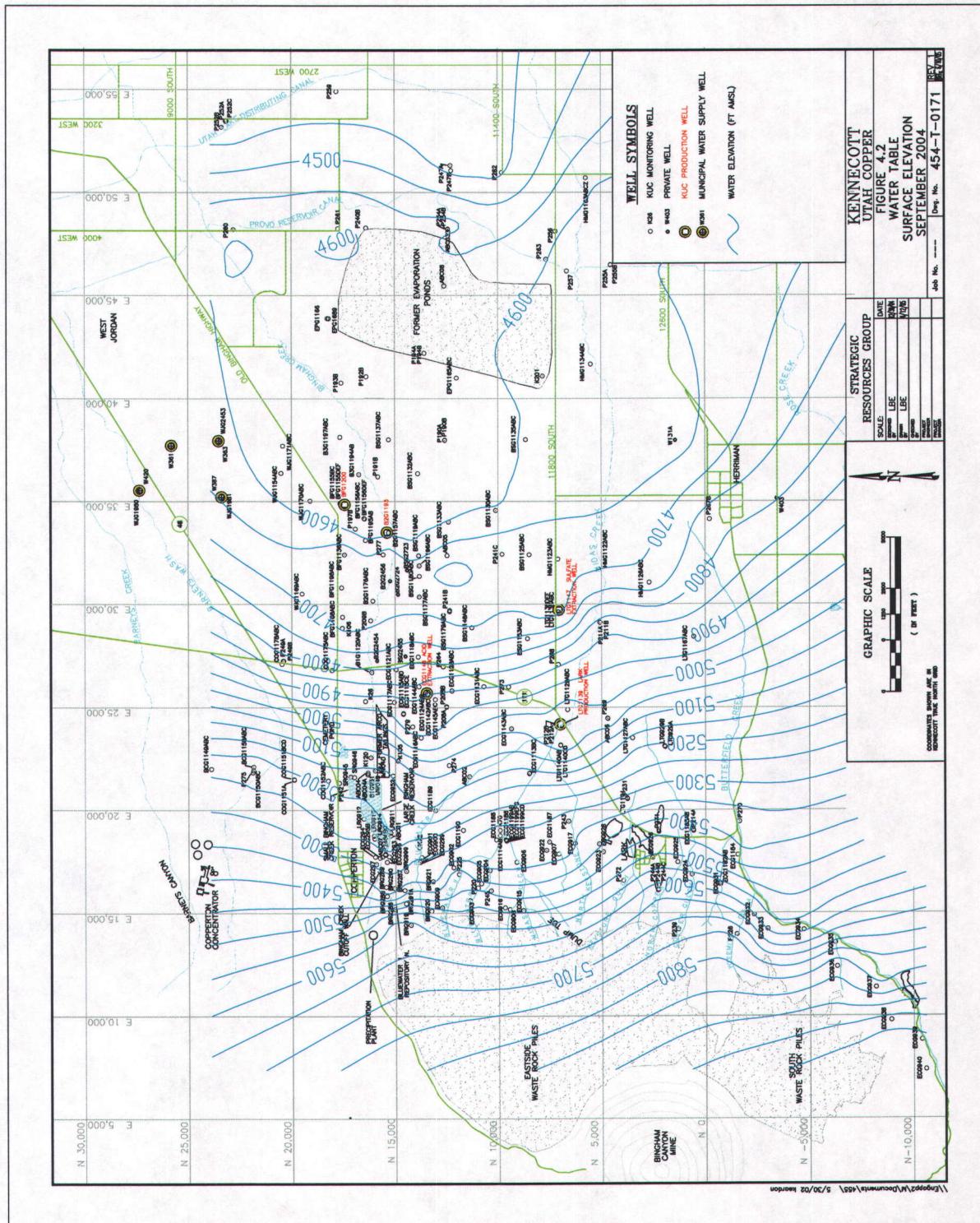
Collectively the water table has dropped due to pumping over an area covering approximately 25,000 feet north to south and 25,000 feet east to west.

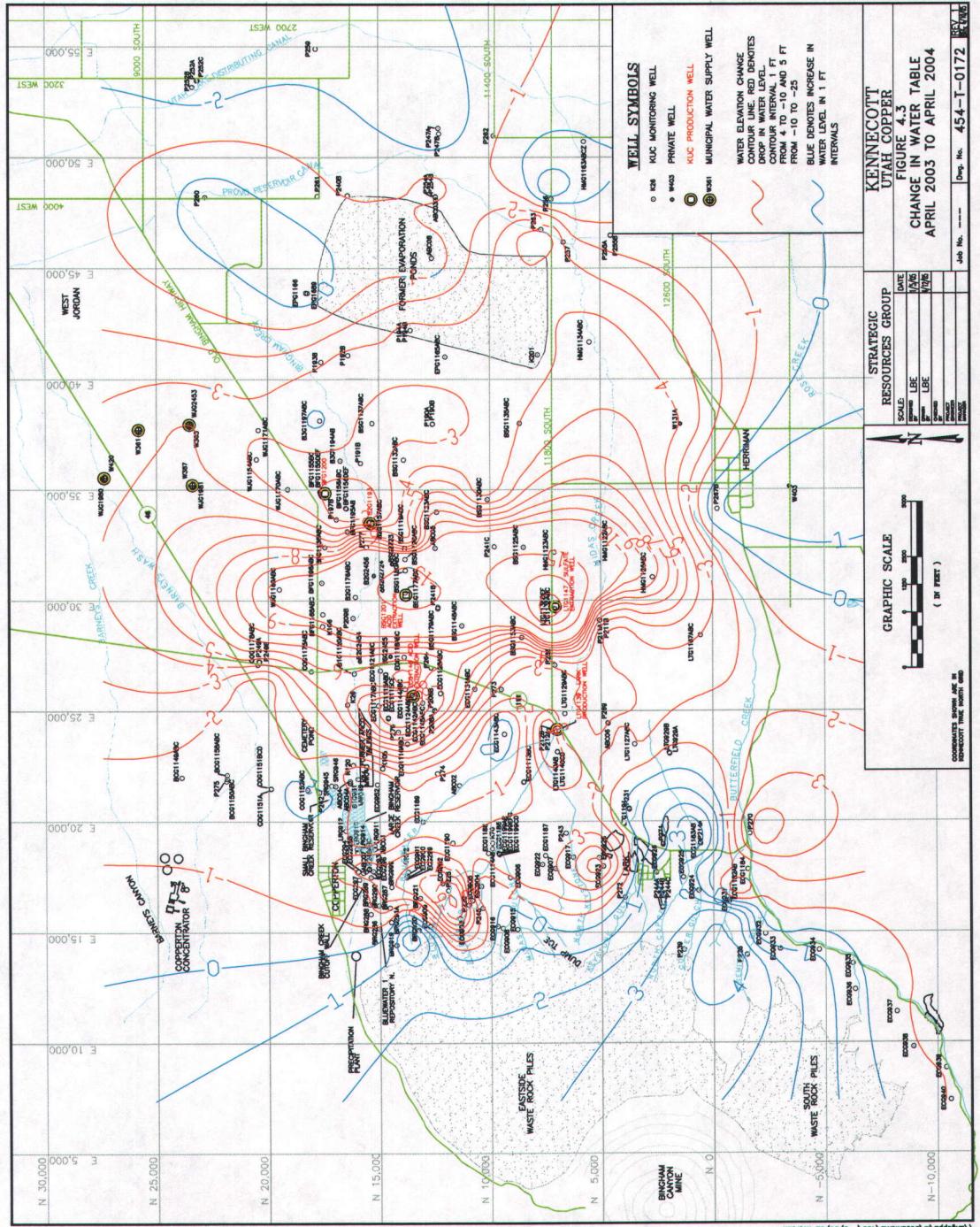
Many of the changes seen in the LTG1147, LTG1139, and Herriman area are due to pumping that was taking place in and up to September 2004 that did not take place in and up to September 2003. Production wells that influenced the drop in this area are LTG1147, LTG1139, and Herriman's new production well. It should be noted that later in 2004, production at LTG1139 and LTG1147 decreased dramatically.

Although there are few monitor wells for this investigation in the Herriman area, there appears to be a marked drop in the water table in this area. It is suspected that increased pumping from a municipal well in Herriman is responsible for this change.

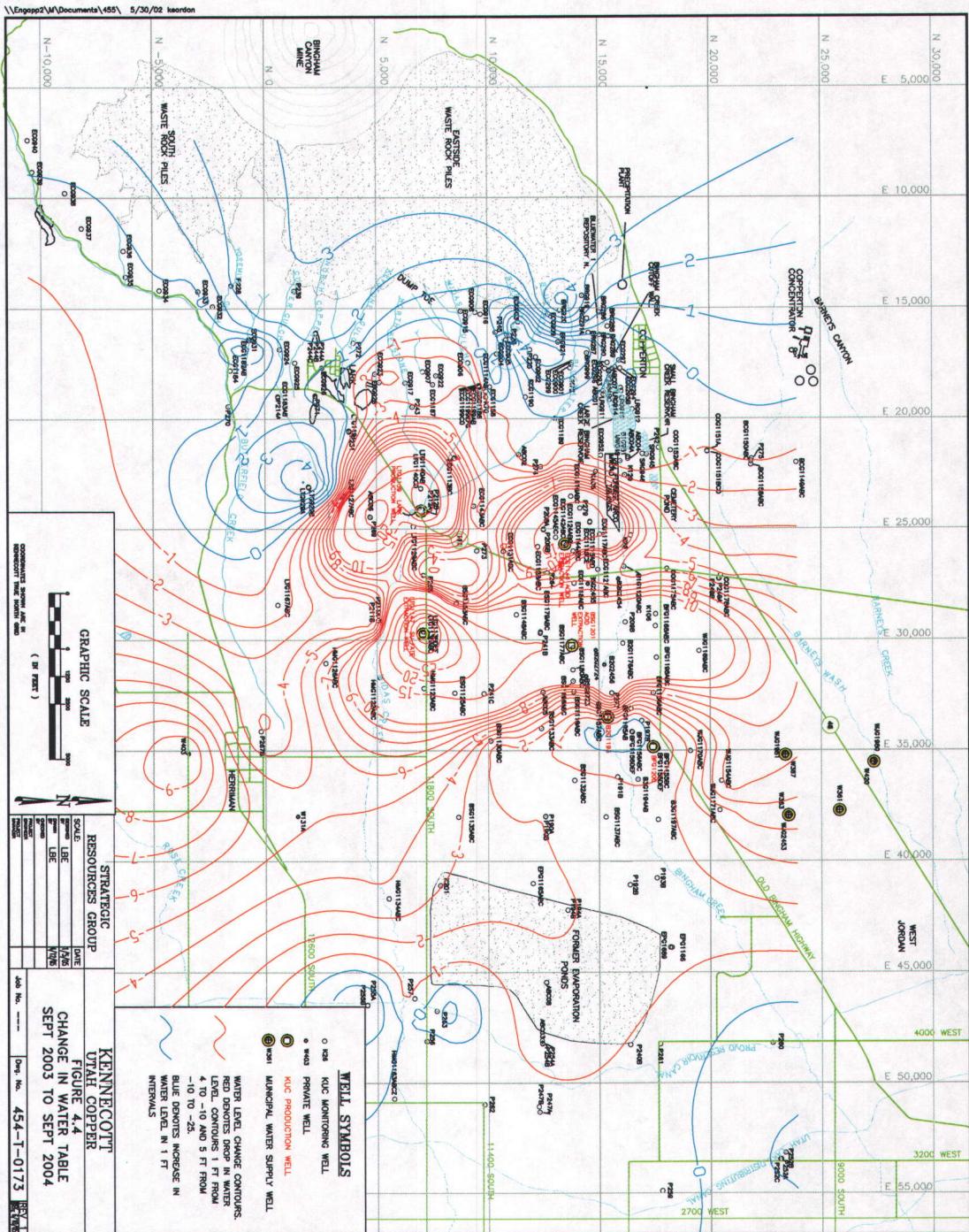
There are some areas located to the immediate east of the Kennecott waste rock piles where the water table has risen in the last year. Changes of up to 4 feet in the Bluewater 1 Repository area and changes of up to 2 feet from the repository south to Butterfield Canyon have been measured.







\EngagePP2\MyDocuments\455\ 5/30/02 keardon



Site	12/19/02	3/11/04	Difference
1/4 Section 15/22	---	5104.350	---
1/4 Section 13/14	---	4943.947	---
1973 West	---	5205.333	---
K105	5341.950	5341.996	0.046
BSG1180	5078.004	5078.010	0.005
WJG1170	4968.166	4968.016	-0.150
BFG1156a	4997.262	4997.275	0.013
BSG1137	4941.591	4941.549	-0.041
ECC1124	5250.985	5250.969	-0.016
ECC1116	5318.519	5318.518	-0.001

Table 5.1 Subsidence Survey Data (Elevation Feet AMSL)

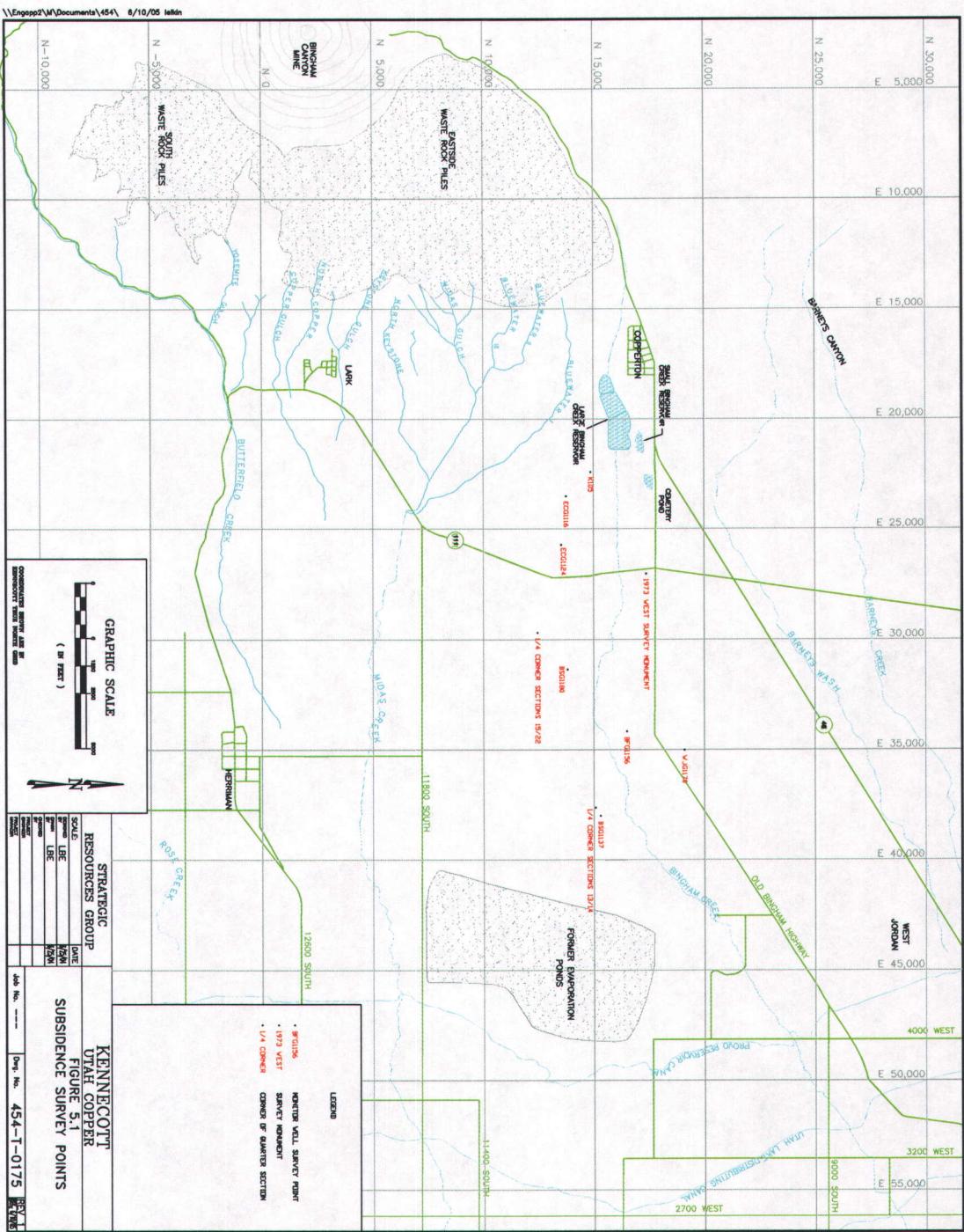
The data show no notable ground elevations changes. Three of the surveyed sites were higher in elevation in March 2004 than in December 2002. The site with the greatest change was 0.150 feet lower in March 2004 than December 2002. This site is monitor well WJG1170 located to the south of the West Jordan well field and north of the KUCC change was 0.150 feet higher in March 2004 than December 2002. This site is monitor well BSG1137 located to the south of the West Jordan well field and north of the KUCC production wells. The elevation change for the other six sites were between 0.041 feet lower and 0.046 feet higher for the March 2004 survey.

The sites were surveyed using a global positioning system (GPS) unit (Leica System 530). The degree of accuracy of this GPS unit is approximately 0.25 centimeters (0.098 inches or 0.008 feet). Table 6.1 lists the surveyed points, the survey data and shows the change in elevation between the two survey events.

Seven wells were chosen as survey sites. Six of the selected sites are located in or near the plume core and one site is located south of the West Jordan well field. Each well has a cement pad that surrounds the steel surface casing and each pad has a steel bolt cemented into it. The steel bolt was the survey point for six of the wells. The seventh well was surveyed on top of the steel surface casing. Three additional survey sites were added for the March 2004 survey. These include two quarter-section corners (Towmship 3S, Range 2W, Sections 13/14 and Sections 15/22) and one survey monument (1973 West). These sites are also located near the plume core area. Survey site locations are shown on Figure 6.1.

The RDA Monitoring Plan calls for measuring ground surface elevation in Zone A to assess possible ground subsidence caused by groundwater extraction from the plume area. KUCC monitored ground elevation at seven survey sites in December 2002 and March 2004. Six of the selected sites are located in or near the plume core and one site is located south of the West Jordan well field. Each well has a cement pad that surrounds the steel surface casing and each pad has a steel bolt cemented into it. The steel bolt was the survey point for six of the wells. The seventh well was surveyed on top of the steel surface casing. Three additional survey sites were added for the March 2004 survey. These include two quarter-section corners (Towmship 3S, Range 2W, Sections 13/14 and Sections 15/22) and one survey monument (1973 West). These sites are also located near the plume core area. Survey site locations are shown on Figure 6.1.

## 5. SUBSIDENCE



If the monthly average Net Neutralization Potential (NNP), calculated using the Modified Sobek Procedures, of the Copper Concentration General Mill Tailings (GMT) is less than  $5 \text{ t CaCO}_3/\text{kt}$  or if the Neutralization Potential Ratio (NPR) is less than 1.1, then the average monthly NNP of samples collected from the tailings North Splitter Box (NSB); an

**6.1.3 Integration with Tailings Disposal System**  
KUCC will meet all UPDES discharge criteria at Outfall 012 from the North Impoundment to Great Salt Lake (or other permitted outfalls).

### 6.1.3 Integration with Tailings Disposal System

6.1.2 Solution Chemistry in the Iauings Line  
The system must be able to maintain a fluid pH of 6.7 or greater as measured at the North Splitter Box (Sample Point MCP2536) with 90% availability to ensure dissolved metal precipitation and sedimentation in the tallings impoundment.

## 6.1.2 Solution Chemistry in the Tailings Lime

- Tailings: 120,000 to 200,000 tpd
  - Acid Plume Water: 1000 to 2500 gpm
  - Meteoric Leach Water: 800 to 1,500 gpm
  - Zone A RO Treatment Concentrates: 600 to 800 gpm

When fully operational, the tailings process circuit must be able to handle the following maximum flows with 90% availability:

### 6.1.1 Flow

With respect to the disposal of acidic waters in the tailings system, the RDRAs proposed performance criteria. The rationale for the performance criteria is provided in Section 3 of the RDRAs Report and elaborated with supporting data in Appendix C to that report.

## 6.1 Performance Criteria

KUCC monitors the chemistry of the tailings system in real time to assure that acidic plume waters and other mining-affected waters do not adversely impact the process water system or the long-term acid-generating potential of the tailings.

KUCC manages groundwater extracted from the acid plume and other mining-affected waters in the tailings pipeline and the North Tailings Impoundment. Other waters managed in this circuit include meteoric drainage from the Eastside Collection System, RO concentrate from treatment of the Zone A sulfate plume, and water from dewatering of the mine pit. Acid plume water, meteoric leach water, and RO concentrate are commingled in and pumped through the Wastewater Disposal Pump Station (WDPs) to the beginning of the tailings pipeline. The mine dewatering flows are pumped directly to the process circuit through two different lines.

6. TAILINGS CHEMISTRY

accessible point near the end of the tailings line) must have an NNP and NPR that are equal to or higher than the Copperton Mill Tailings for the month.

If the monthly average NNP of the Copperton Concentrator GMT is greater than 5 t CaCO<sub>3</sub>/kt or the NPR is more than 1.1, then the average monthly NNP of tailings samples collected from the NSB must have an NNP of at least 5 t CaCO<sub>3</sub>/kt.

The monthly NNP value will be determined based on a rolling six-month average from monthly composite samples collected at the GMT and tailings impoundment discharge locations.

## 6.2 Flow and Tailings pH

KUCC continuously monitors pH at the North Splitter Box and flow through the WDPS. Daily data for 2003 and 2004 are reported in Appendix C. These data are plotted on Figures 6.1 and 6.2 using a 7-day rolling average. Also plotted on these figures is ore throughput through Copperton Concentrator which directly correlates to tailings production reporting to tailings line. The correlations between WDPS flow, mill throughput, and tailings pH are readily apparent in these graphs.

The data presented in Appendix C and Figures 6.1 and 6.2 indicate that the tailings process circuit can routinely handle flows that meet or exceed the stipulated criteria. The Remedial Design specified the ability to handle acidic flows from WDPS up to 3,500 gpm. During 2003 and 2004, the system readily managed flows up to 6,500 gpm. There are operational interruptions, including scheduled events such as Concentrator maintenance and unscheduled interruptions due to power failures. In all cases, the flow cutoff is rapid; the system re-builds flow in an orderly manner; and the operational conditions are re-established rapidly.

The monitoring data show that the tailings process circuit maintained the pH at North Splitter Box above pH 6.7 for at least 362 of 365 days in 2003. This is 99.2% availability, greatly exceeding the design-basis 90%-availability requirement. In 2004, the pH at the North Splitter Box was above 6.7 each day, achieving 100% availability.

## 6.3 Tailings Chemistry

As required by the monitoring program described in the Remedial Design Report (KUCC, 2002, Section 3.4.2.4, p. 67), KUCC collects aqueous metals concentrations in tailings at NSP to confirm that the geochemical processes identified during the Remedial Design investigations are maintained.

There are no numeric criteria for the specific chemical conditions – other than pH and NNP – within the process circuit. Inspection of the data presented in Appendix C shows that the pH-driven solubility controls on dissolved metals identified in laboratory and field-scale pilot testing continue to operate.

#### **6.4 UPDES Permit Compliance**

KUCC maintained compliance with discharge limits for metals concentrations during 2003 and 2004 with the exception of a daily and monthly exceedance for arsenic in March 2004. This exceedance was attributed to an operational upset rather than acid water treatment.

#### **6.5 Tailings Net Neutralization Potential**

KUCC monitors NNP monthly in general mill tailings (GMT), which provides tailings neutralization characteristics prior to introduction of acid water flows, and NNP at the North Splitter Box (NSB), which shows the characteristics of reacted tailings. These data are used to measure performance against performance criteria and assess the impact of acid water neutralization on the long-term acid rock drainage potential of the tailings.

Monthly and 6-month rolling average NNP data are presented in Table 6.3 and plotted in Figures 6.3 and 6.4. What is observed in these data are some months in which the NNP value at NSB is greater than that at GMT and other months in which GMT is greater. There is no general trend of these results, neither with respect to time, nor with the value of NNP. Applying the tests listed in Section 6.1 indicates that the performance criteria were met less than half of the months during 2003 and 2004. However, despite some failing of the performance criteria, KUCC is convinced that utilization of tailings for acid water treatment had not prejudiced the long-term acid generating potential of the tailings. Rather, KUCC holds that the criteria were not appropriately structured to allow for analytical uncertainty in measuring NNP.

The analysis of a broader data set which leads to the conclusion that acid water addition to tailings is not impacting the acid-generating potential of the tailings is presented in Appendix D. Factors which support this conclusion are:

1. Gross acidity of the combined acid flows reporting to the tailings line has decreased by approximately 30% since the Remedial Design period indicating lower neutralization demand by the acid flows.
2. There has been no discernible change in the aqueous alkalinity of the tailings. However, a comparison of tailings production shows that the operational ore processing has increased by 50% since the period of the Remedial Design, and slurry water has increased from approximately 13,000 gpm in 2001 to 28,000 gpm in 2004. Thus the total aqueous alkalinity of un-reacted tailings has increased by more than 100%.
3. The absolute values of neutralization potential (a component of NNP) measured at GMT and NSB are randomly distributed with respect to one another, and there is no meaningful difference between the empirical distributions.

- The alkalinity at NSB has remained within the range of alkalinity during the Remedial Design period, and there is excess aqueous alkalinity present at NSB capable of buffering the solution pH to circum-neutral.

**Table 6.1 Tailings NNP (t CaCO<sub>3</sub> eq/1000 t)**

	Monthly		6-Month Average	
	GMT	NSP	GMT	NSP
Jan-03	2	3	2.0	3.0
Feb-03	-2	3	0.0	3.0
Mar-03	-1	-4	-0.3	0.7
Apr-03	-10	-3	-2.8	-0.3
May-03	-10	-9	-4.2	-2.0
Jun-03	7	7	-2.3	-0.5
Jul-03	1	-3	-2.5	-1.5
Aug-03	-2	-1	-2.5	-2.2
Sep-03	6	6	-1.3	-0.5
Oct-03	15	10	2.8	1.7
Nov-03	22	10	8.2	4.8
Dec-03	9	2	8.5	4.0
Jan-04	15	5	10.8	5.3
Feb-04	2	-2	11.5	5.2
Mar-04	5	2	11.3	4.5
Apr-04	7	9	10.0	4.3
May-04	2	8	6.7	4.0
Jun-04	-6	-6	4.2	2.7
Jul-04	-4	-9	1.0	0.3
Aug-04	4	3	1.3	1.2
Sep-04	5	-1	1.3	0.7
Oct-04	12	15	2.2	1.7
Nov-04	-11	-8	0.0	-1.0
Dec-04	21	15	4.5	2.5

In light of this discussion, KUCC proposes to amend the performance criteria of the Remedial Design relative to integration with the Tailings Disposal System. The essence of this proposal is a more meaningful metric—neutralization potential (NP) rather than net neutralization potential (NNP)—and a provision for uncertainty in analytical measurements.

NNP is defined as the difference between Neutralization Potential (NP) and Acid Generating Potential (AP):

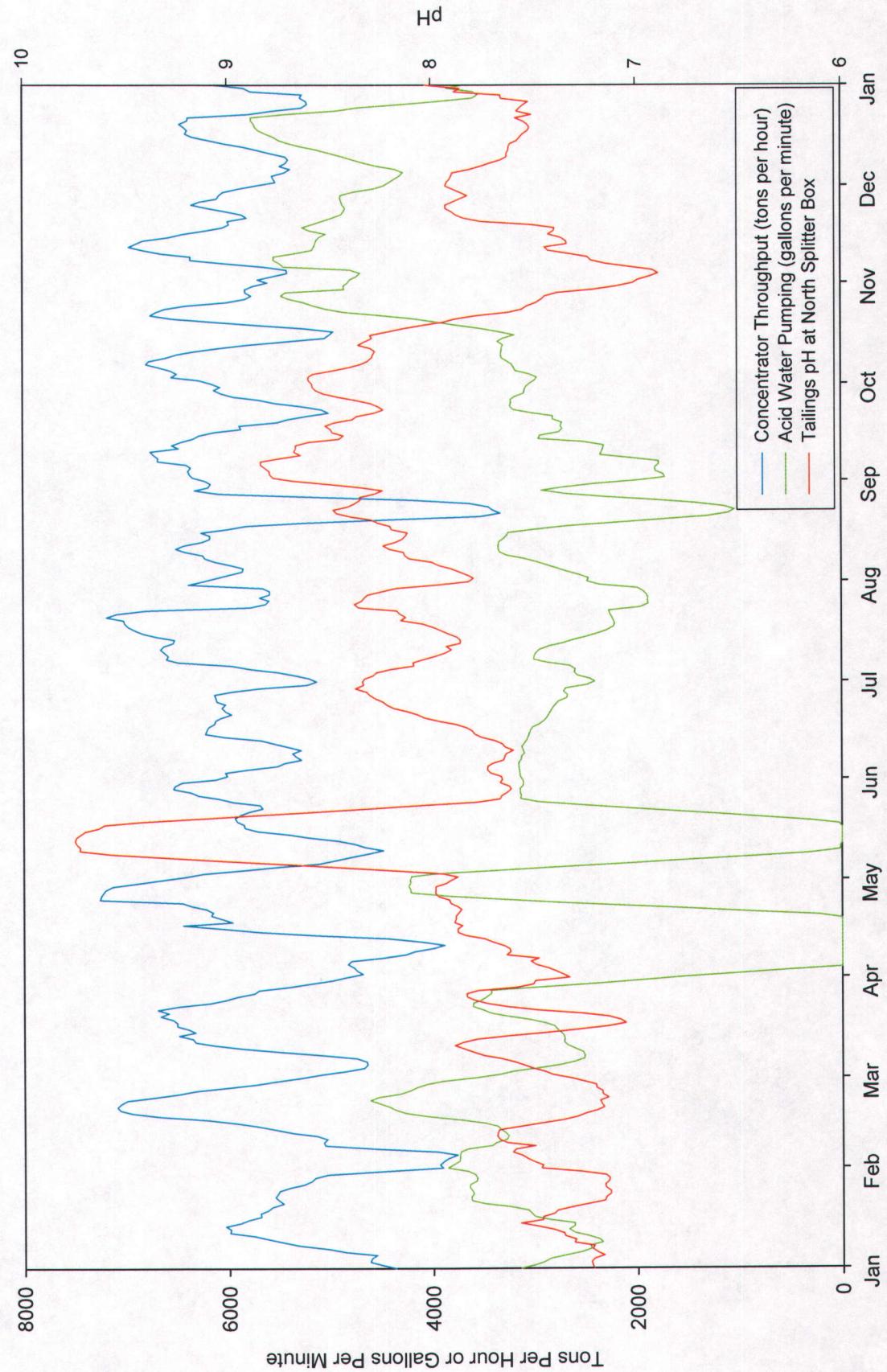
$$\text{NNP} = \text{NP} - \text{AP}$$

NP and AP are two separate analytical measurements. The analytical uncertainty in NNP values is the combined uncertainty of these measurements. AP is based on a measurement of the sulfide-sulfur content of a solid sample. The quantity of solid-form sulfide sulfur in tailings is not expected to change as a result of acid water addition. The only effect of acid water addition can be a reduction of NP. Thus, KUCC proposes using NP as a performance metric to eliminate the added uncertainty associated with AP determinations.

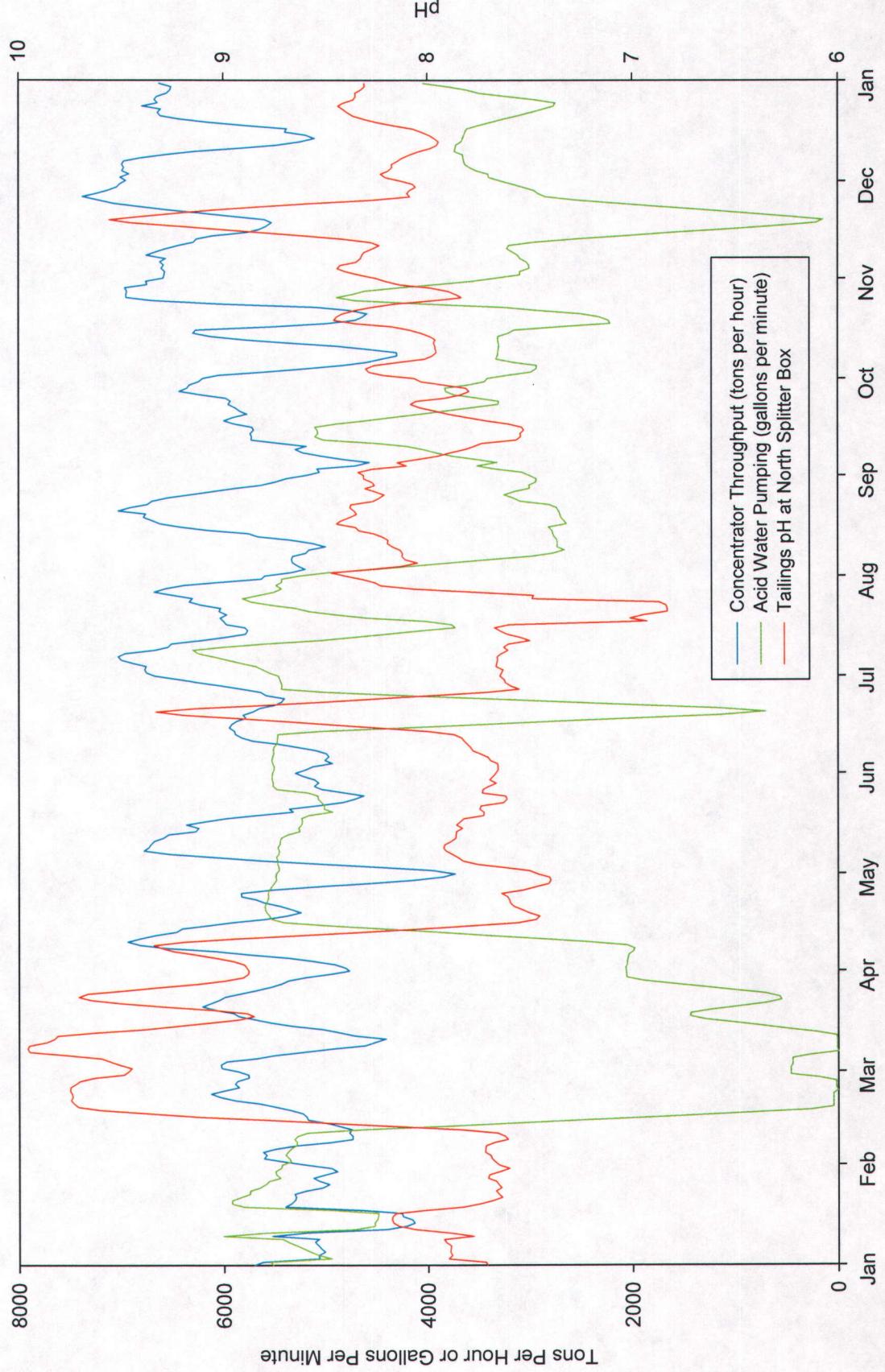
The estimated precision of the NP value measured in tailings samples to date is approximately 2 t CaCO<sub>3</sub> eq/kt, based on an acceptable RPD of +/- 10% for Sobek NP and detection limits for total inorganic carbon. Thus, KUCC's proposed criteria for integration with the tailings disposal system are as follows:

1. KUCC will meet all UPDES discharge criteria at Outfall 012 from the North Impoundment to Great Salt Lake (or other permitted outfalls).
2. The monthly Neutralization Potential (NP) value of samples collected from the tailings North Splitter Box must be either greater than or equal to the NP of Copperton Mill Tailings for the month or at least 5 t CaCO<sub>3</sub>eq/kt. The monthly NP value will be determined based on a rolling six-month average from monthly composite samples collected at the GMT and tailings impoundment discharge locations. In making comparisons, the uncertainty in both GMT and NSB will be taken to be 10% of the average value, and a significant difference must lie outside the joint uncertainty.
3. The aqueous pH at North Splitter Box must be greater than or equal to 6.7 with 90% availability over a calendar year and the aqueous alkalinity must be greater than or equal to 10 mg CaCO<sub>3</sub>eq/L with 90% availability over a calendar year. These parameters, too, will be evaluated as rolling six-month averages.

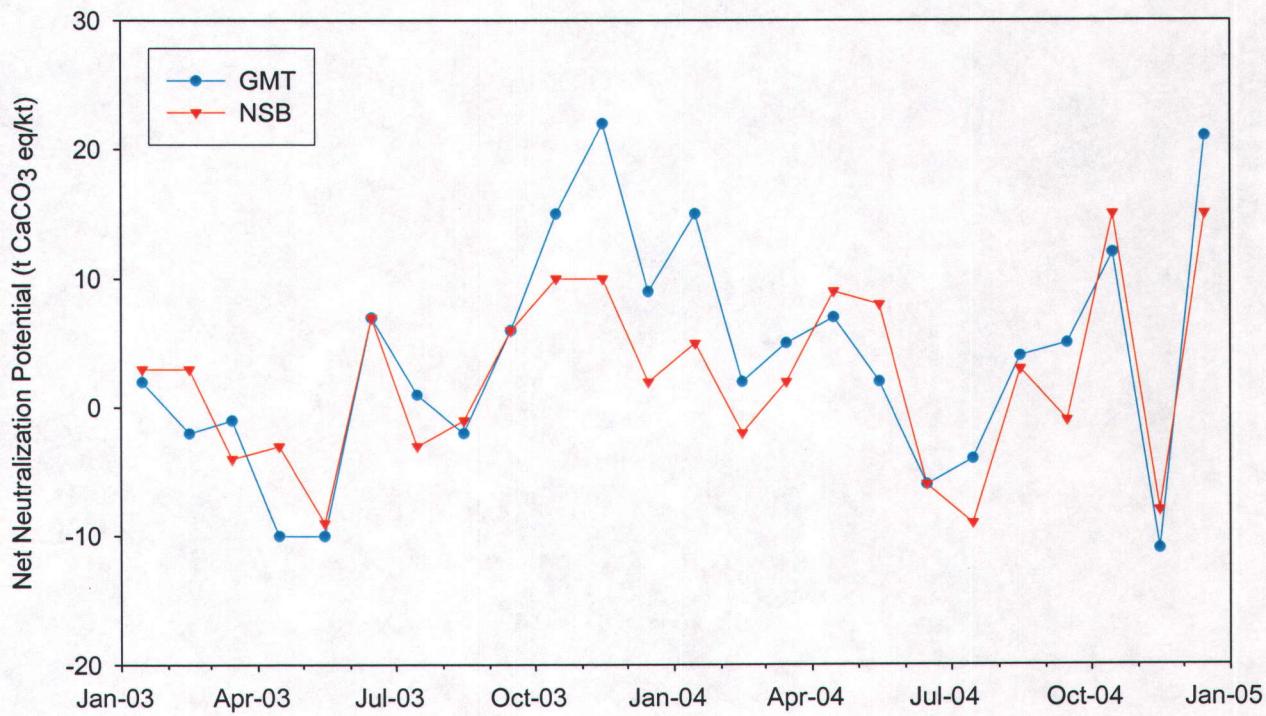
**Figure 6.1 2003 Tailings Circuit Monitoring Data (7-Day Average)**



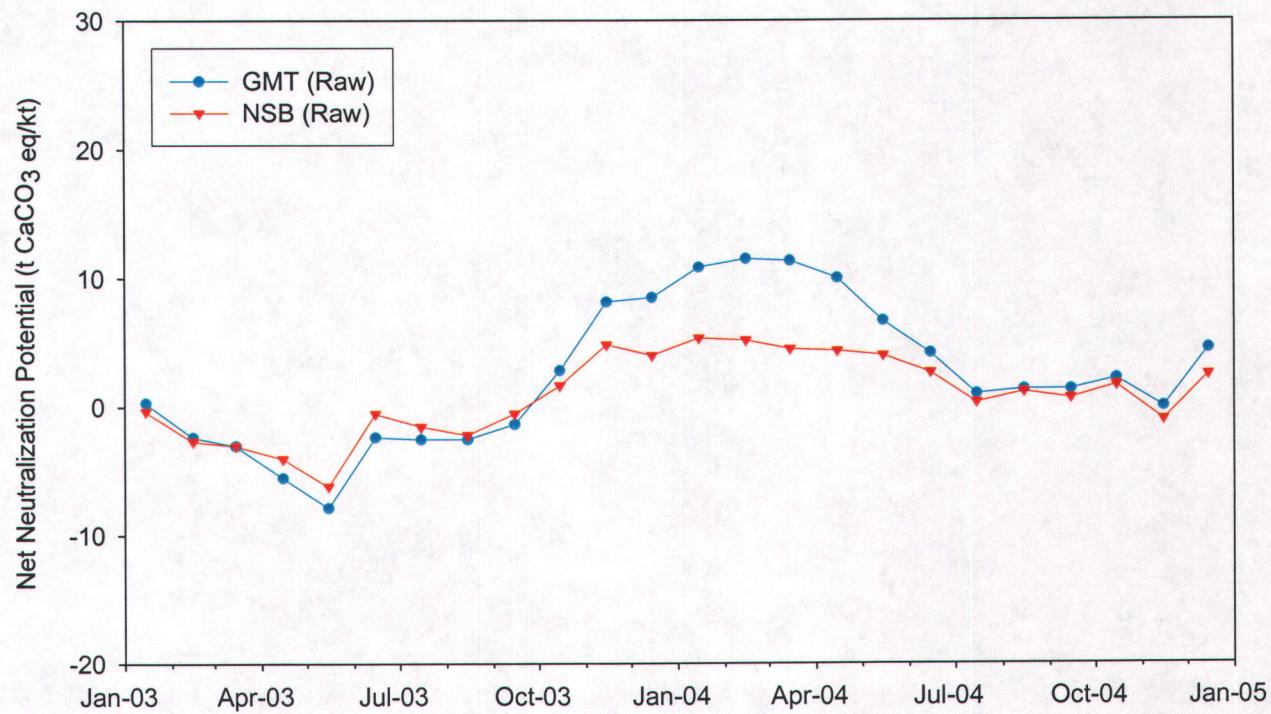
**Figure 6.2 2004 Tailings Circuit Monitoring Data (7-Day Average)**



**Figure 6.3 Tailings Net Neutralization Potential Data**



**Figure 6.4 6-Month Average Tailings Net Neutralization Potential Data**



## **7. WORKS CITED**

Environmental Protection Agency and Utah Department of Environmental Quality, 2000, Record of Decision, KUCC South Zone, Operable Unit 2, Southwest Jordan River Valley Groundwater Plumes, December 13, 130 p.

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Kennecott Utah Copper Corporation (KUCC), 1998, Final draft remedial investigation report for KUCC south facilities groundwater plume, southwest Jordan Valley, Utah, Version B, March, 1998, variously paged.

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Kennecott Utah Copper Corporation (KUCC), 2005a (KUCC), Groundwater Characterization and Monitoring Plan, Revision 7, March.

Kennecott Utah Copper Corporation (KUCC), 2005b, Standard Operating Procedures for Water Sampling, Revision 5, March.

Kennecott Utah Copper Corporation (KUCC), 2005c, Quality Assurance Project Plan for the Groundwater Characterization and Monitoring Plan, Revision 6, March.

## **APPENDIX A**

### **Water Chemistry Data, 2002-2004**

Table A-1 Water Quality Data 2002-20004

	PH	Cond	Temp	D/TW	TDS	Ca-T	Mg-T	Na-T	K-T	SO4	Cl	F	Alk	mg/l CaCO3	Acidity	AI-D	As-D	Ba-D	Cd-D	Cr-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D (Hg)	Ag-D	Zn-D
Well	Date	su	m/°Cm	C	Fl	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
W22	3/8/02	7.0	1181	15	855	162	52	50	4.5	232	150	0.2	272	<0.015	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	6/14/02	7.0	1267	13	905	137	57	55	5.3	248	146	0.2	218	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	9/19/02	6.9	1188	13	830	167	45	42	4.2	219	149	0.2	266	0.188	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	12/20/02	7.0	1238	12	970	189	55	51	5.2	248	152	0.2	247	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	3/28/03	7.2	1238	12	970	189	55	51	5.2	248	153	0.2	281	0.117	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	6/27/03	6.9	1239	15	830	158	45	44	4.2	204	149	0.2	266	0.067	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	9/29/03	7.2	1239	15	830	158	52	53	5.5	176	146	0.2	281	<0.015	<0.008	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	12/24/03	7.0	1284	13	830	184	54	52	5.1	244	148	0.2	276	<0.015	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	3/30/04	7.1	1269	14	830	185	55	50	4.8	254	146	0.2	283	0.037	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	5/21/04	7.2	1322	15	890	195	55	50	4.8	254	146	0.2	285	0.175	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W22	9/28/04	7.0	1186	14	31	800	152	42	4	175	141	0.2	275	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
W22	12/21/04	7.1	1246	12	31	920	175	53	53	4.7	200	143	0.3	275	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
K26	9/12/02	7.2	DRY		13.5	201.68	1170	209	56	80	5.6	177	385	0.2	186	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
K72	6/18/02	7.0	1850	15	144.4	1080	205	51	71	5.7	160	380	0.2	164	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
K72	6/21/03	7.0	1750	15	144.4	1140	205	53	72	5.7	127	382	0.3	179	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
K72	9/29/04	7.0	1684	16	215	1070	208	53	72	5.7	141	356	0.3	184	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
K72	12/13/04	7.1	1740	14.5	1140	206	56	81	3.4	119	98	0.1	160	<0.015	0.007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
W189	3/6/02	7.0	807	16	200	550	88	35	42	3.3	112	100	0.1	179	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
W189	3/28/03	7.2	816	18	200	470	88	35	41	3.1	111	101	0.2	164	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
P190A	9/10/02	7.0	DRY		1150	203	70	57	5	306	248	0.1	188	<0.018	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
P190A	9/23/03	7.0	DRY		1150	203	70	57	5	306	248	0.1	188	<0.018	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
P190B	9/5/02	7.2	1468	17	309.48	243	67	54	3.4	324	237	0.1	195	<0.019	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
P208A	7/28/04	6.4	4280	18	273.43	4880	570	465	97	3150	137	0.2	194	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
P208A	7/3/03	6.6	4100	18	282.36	4860	665	502	94	3184	150	0.3	193	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
P208A	9/7/04	6.7	4150	20	265.93	4950	542	639	89	340	158	0.5	175	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
P208B	6/21/02	4.5	6250	16	274.1	8100	465	103	153	7070	168	61.3	5	188	<0.018	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
P208B	7/3/03	4.6	5840	16	276.21	7660	485	1020	90	12.5	5860	188	47.5	5	188	<0.018	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P208B	9/7/04	4.5	5150	16	302.98	475	96	82	54	17.7	5070	201	54	5	188	<0.019	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P241B	7/11/02	3.6	3180	16	301.51	10600	498	920	90	14.1	81.80	116	59.3	5	263	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P241B	6/27/03	3.7	7390	16	391.51	10700	473	1290	74	9.2	7200	115	53	5	254	<0.011	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P241B	10/16/03	3.7	6850	13	400	9740	413	1310	63	7.4	6600	120	52	5	254	<0.012	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P241B	6/23/04	3.5	6760	16	409.88	10700	399	120	66	7.7	6610	119	57	5	268	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P241C	11/6/02	7.2	1791	14	298.04	1150	249	70	54	7	440	257	0.2	159	<0.015	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
P241C	7/8/03	7.2	1816	16	301.28	1440	261	71	53	4.3	453	284	0.2	181	<0.016	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
P241C	10/14/04	7.0	1844	15	320.4	1640	324	965	74	4.6	62																			

Well	Date	pH	Cond	Temp	D/W	TDS	Ca-T	Mg-T	Na-T	K-T	SO4	Cl	F	Alk	mg/l CaCO3	mg/l CaCO3	Acidity	Al-D	As-D	Ba-D	Cd-D	Cr-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	mg/l	Se-D	(DRC)	Ag-D	Zn-D
P244B	12/6/04	6.7	5370	11	48.08	497.0	1080	234	9.1	1140	1130	0.3	537	301	<0.001	<0.001	<0.02	<0.02	<0.005	<0.01	<0.02	<0.02	<0.005	<0.01	<0.002	<0.001	<0.001	0.017					
P244C	2/27/02	7.1	4010	11	53.67	2880	565	148	160	9.7	828	0.2	376	<0.015	<0.005	0.077	<0.001	<0.01	<0.02	<0.005	<0.01	<0.02	<0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001				
P244C	2/4/04	6.9	4410	11	54.28	3340	769	160	172	9.6	1100	0.2	426	<0.005	<0.005	<0.001	<0.001	<0.01	<0.02	<0.005	<0.004	<0.024	<0.002	<0.002	<0.002	<0.001	<0.001	4.34					
P248A	3/12/02	4.0	2350	13	84.61	1860	222	200	63	4.7	1120	188	<5	238	<0.005	<0.01	0.038	<0.01	0.038	<0.01	0.013	<0.01	0.013	<0.002	<0.002	<0.002	<0.001	<0.001	4.57				
P248A	5/31/02	3.9	2330	16	85	2010	208	183	62	4	1150	186	3	250	<0.005	<0.01	0.031	<0.01	0.032	<0.01	10.9	<0.3	<0.017	7.52	<0.002	<0.002	<0.002	<0.001	<0.001				
P248A	9/12/02	4.2	2370	12	84.94	2000	213	180	60	3.8	1130	184	5.7	247	26.9	<0.005	<0.01	0.032	<0.01	0.017	<0.01	<0.3	<0.015	6.92	<0.004	0.509	<0.002	<0.001	4.64				
P248A	11/2/02	4.2	2350	13	85.82	1810	214	173	62	4.2	1070	186	5.3	255	26.3	23.2	<0.005	<0.01	0.031	<0.01	10.2	<0.3	<0.017	6.17	<0.004	0.449	<0.002	<0.001	4.13				
P248A	6/9/03	4.1	210	17	86.25	1830	218	168	51	4.2	1013	188	2.6	256	27.6	23	<0.005	<0.01	0.036	<0.01	8.79	<0.3	<0.019	6.74	<0.008	0.436	<0.002	<0.001	3.95				
P248A	9/15/03	4.2	3350	13	86.75	1730	199	152	51	3.8	905	194	6	255	26.2	21.7	<0.005	<0.01	0.032	<0.01	8.48	<0.3	<0.017	6.17	<0.002	0.397	<0.001	<0.001	3.71				
P248A	12/23/03	4.2	2050	13	86.83	1580	184	133	49	3.4	924	190	7.5	255	183	19.9	<0.005	<0.01	0.027	<0.01	8.06	<0.3	<0.018	5.15	<0.005	0.384	<0.001	<0.001	3.32				
P248A	2/1/04	4.2	2020	11	86.58	1650	214	144	52	3.6	900	197	8.1	255	205	19.4	<0.006	<0.01	0.032	<0.01	8.04	<0.3	<0.018	5.51	<0.002	0.471	<0.001	<0.001	4.57				
P248A	6/3/04	4.2	2030	15	87.3	2130	192	132	58	3.4	1000	194	5.8	255	180	19.1	<0.005	<0.01	0.029	<0.01	7.96	<0.3	<0.017	5.62	<0.002	0.354	<0.001	<0.001	3.46				
P248A	8/20/04	4.3	2040	15	87.56	1640	195	131	51	3.4	1000	193	9.2	255	272	18.2	<0.005	<0.01	0.032	<0.01	7.97	<0.3	<0.017	5.62	<0.002	0.337	<0.001	<0.001	3.3				
P248A	12/1/04	4.3	2030	11	87.07	1620	207	127	61	3.8	916	192	8	255	135	17	<0.005	<0.01	0.026	<0.01	7.62	<0.3	<0.019	4.82	<0.008	0.436	<0.002	<0.001	3.49				
P248B	3/12/02	6.4	3080	13	85.02	3280	525	336	73	11	2040	110	<5	31	<0.005	<0.01	0.038	<0.01	0.013	<0.01	1.25	<0.005	<0.002	0.339	<0.001	0.384	<0.001	<0.001	3.18				
P248B	9/2/02	6.2	3170	12	86.13	3220	507	305	67	10.8	2050	112	2.3	130	110	74.7	<0.005	0.011	0.038	<0.01	1.48	<0.3	<0.005	13.4	<0.002	0.466	<0.001	<0.001	3.53				
P248B	9/15/03	6.2	3350	14	87.1	3170	464	282	66	9.2	2000	113	2.2	168	119	52.5	<0.005	0.011	0.033	<0.01	7.96	<0.3	<0.005	12.5	<0.004	0.393	<0.001	<0.001	3.24				
P248B	2/1/04	6.6	3030	9	87.08	3200	430	256	64	9.2	2080	114	4	111	46	54.9	<0.005	0.013	0.034	<0.01	3.01	<0.3	<0.005	11.7	<0.002	0.453	<0.001	<0.001	3.79				
P248B	8/20/04	6.0	2710	17	87.83	2940	439	248	62	9	1980	109	2.3	143	80	52.7	<0.005	0.013	0.034	<0.01	1.11	<0.3	<0.005	10.4	<0.002	0.477	<0.001	<0.001	2.6				
P248C	3/12/02	6.5	1307	12	80.41	940	183	72	38	3.9	422	119	120	120	118	40.8	<0.005	0.003	0.033	<0.01	0.237	<0.3	<0.005	15.4	<0.002	0.339	<0.001	<0.001	2.28				
P248C	3/21/03	6.5	1301	12	81.37	940	157	61	34	3.9	450	122	0.2	122	100	32.8	<0.005	0.003	0.032	<0.01	1.48	<0.3	<0.005	13.4	<0.002	0.466	<0.001	<0.001	2.45				
P248C	9/15/03	6.3	1221	14	82.73	940	165	64	35	3.4	407	126	0.6	117	111	40.4	<0.005	0.011	0.033	<0.01	1.38	<0.3	<0.005	12.5	<0.004	0.393	<0.001	<0.001	3.24				
P248C	2/10/04	6.5	1017	12	82.83	970	179	69	37	3.7	431	120	0.5	118	116	32.4	<0.005	0.013	0.034	<0.01	3.01	<0.3	<0.005	11.7	<0.002	0.453	<0.001	<0.001	3.79				
P248C	8/20/04	6.3	1202	14	83.6	927	164	59	33	3.2	410	122	0.7	122	100	32.9	<0.005	0.017	0.034	<0.01	1.87	<0.3	<0.005	10.4	<0.002	0.377	<0.001	<0.001	2.6				
P279	11/2/02	3.4	13320	13	353.43	25900	440	3330	66	7.3	14800	213	107	<5	11800	1040	0.024	<0.005	0.003	<0.01	0.217	<0.3	<0.005	0.005	<0.002	0.002	<0.001	<0.001	0.05				
P279	8/24/04	3.6	11590	14	381.53	23200	368	2480	65	5.8	15600	208	103	<5	16100	889	0.022	<0.005	0.008	<0.01	0.388	<0.3	<0.005	1.35	<0.002	0.061	<0.001	<0.001	73				
W361	6/25/02	7.4	1047	20	67.68	1017	951	39	51	3.8	40	197	0.2	153	<0.015	0.008	0.008	<0.001	0.027	<0.3	<0.005	0.113	<0.002	0.045	<0.001	<0.001	0.245						
W363	9/6/02	7.5	1119	20	65.0	895	119	41.5	48.8	4.3	170	119	0.2	156	133	0.008	<0.005	0.007	<0.001	0.021	<0.3	<0.005	0.103	<0.002	0.068	<0.001	<0.001	0.247					
W363	6/25/02	7.5	966	20	65.0	895	119	39	60	4.3	42	225	0.2	158	<0.015	0.008	0.008	<0.001	0.021	<0.3	<0.005	0.103	<0.002	0.068	<0.001	<0.001	0.248						
W363	9/6/02	7.4	1076	3	251.03	790	125	38	56	3.6	142	109	0.1	158	<0.015	0.007	0.008	<0.001	0.021	<0.3	<0.005	0.103	<0.002	0.068	<0.001	<0.001	0.248						
W363	7/1/03	7.5	1138	3	184	680	113	36	43	3.6	136	109	0.2	158	<0.015	0.009	0.009	<0.001	0.021	<0.3	<0.005	0.103	<0.002	0.068	<0.001	<0.001	0.248						
W363	6/22/04	7.3	884	9	184	600	98	34	39	2.9	156	117	0.2	158	<0.015	0.008	0.008	<0.001	0.021	<0.3	<0.005	0.103	<0.002	0.068	<0.001	<0.001	0.248						
W363	6/22/04	7.6	1084	15	184	600	111	35	42	2.8	126	125	0.2	158	<0.015	0.008	0.008	<0.001	0.021	<0.3	<0.005	0.103	<0.002	0.068	<0.001	<0.001	0.248						
W363	6/25/02	7.5	1119	20	67.68	1060	257	71	58	2.4	263	428	0.2	221	<0.015	0.005	0.005	<0.001	0.021	<0.3	<0.005	0.103	<0.002	0.068	<0.001	<0.001	0.248						
W363																																	

Well	Date	pH	Cond	Temp	DTW	TDS	Ca-T	Mg-T	Na-T	K-T	SO4	Cl	F	Alk	Acidity	Al-D	As-D	Ba-D	Cd-D	Cr-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D (DRC) (hyd)	Ag-D	Zn-D
		su	uS/cm	°C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
LRG911	2/1/04	7.3	2380	9	127.6	2240	444	57	9.1	154	0.2	1280	155	0.2	178	0.16	<0.005	0.024	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.005	<0.005	<0.001	0.028	
LRG911	4/12/04	6.8	2430	14	127.63	2240	461	124	63	10	1220	155	0.2	178	0.16	<0.005	0.027	<0.001	<0.01	0.057	<0.3	<0.005	0.043	<0.002	<0.04	0.005	<0.001	0.069		
LRG911	12/13/04	7.0	2600	15	127.8	2350	457	128	61	9.4	1180	150	0.4	158	0.22	<0.005	0.022	<0.002	<0.01	0.141	<0.3	<0.005	0.32	<0.002	0.53	0.004	<0.001	0.37		
LRG912	4/3/02	6.8	6680	432	637	169	6.5	4810	7.3	9.7	<5	1170	153	0.008	0.239	<0.01	33.1	0.187	<0.005	38.4	0.0003	2.82	<0.002	0.002	20.1	<0.001	19.9			
LRG912	4/7/03	3.6	5420	12	97.9	6020	386	568	158	7.2	4100	213	25	1100	137	0.008	<0.01	0.222	<0.01	32.9	<0.3	<0.005	39.6	<0.002	2.77	<0.001	<0.001	19.9		
LRG912	4/12/04	3.7	5010	15	98.97	5540	408	505	161	7.6	3120	219	24	<5	897	115	<0.001	0.211	<0.01	31.5	<0.3	<0.005	32	<0.002	2.41	0.149	<0.001	19.1		
ECG917	1/28/02	7.2	1764	13	116.79	2209	54	84	4.6	135	389	0.2	189	<0.015	<0.005	0.133	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01		
ECG917	5/24/02	7.2	1764	15	117.15	2120	207	56	92	6.6	140	410	0.2	185	<0.015	<0.005	0.136	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	6/19/02	7.0	1790	15	117.4	1130	227	58	90	5.7	136	415	0.2	188	<0.015	<0.005	0.134	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	7/22/02	7.2	1546	15	117.4	1240	172	49	76	4.8	137	402	0.2	188	<0.015	<0.005	0.141	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	8/22/02	7.3	1705	13	119.58	1030	235	59	94	5.6	150	413	0.2	186	<0.015	<0.005	0.13	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	9/12/02	6.9	1780	14	119.85	1080	224	55	88	4.4	142	407	0.2	191	<0.015	<0.005	0.136	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	10/26/02	7.2	1764	13	118.23	1077	210	58	96	7.6	137	408	0.2	188	<0.015	<0.005	0.134	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.026	
ECG917	11/14/02	7.2	1826	12	118.51	1280	230	58	88	4.3	137	380	0.2	188	<0.015	<0.005	0.128	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	12/17/02	7.2	1826	12	118.47	1310	213	57	89	5.8	140	412	0.2	190	<0.015	<0.005	0.132	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	1/17/03	7.3	1710	12	119.22	1120	220	59	95	6.1	142	398	0.2	186	<0.015	<0.005	0.136	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	2/17/03	7.3	1705	13	119.58	1030	235	59	94	5.6	150	413	0.2	186	<0.015	<0.005	0.13	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	3/27/03	6.9	1780	14	119.85	1080	224	55	88	4.4	142	407	0.2	191	<0.015	<0.005	0.135	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	4/26/03	7.4	1756	13	120.27	1100	209	52	82	5.1	126	399	0.2	189	<0.015	<0.005	0.131	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	5/26/03	7.2	1690	15	120.52	1210	218	56	83	4.7	128	403	0.2	189	<0.015	<0.005	0.133	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	6/26/03	7.2	1761	14	120.97	1080	232	52	81	4.8	125	398	0.2	184	<0.015	<0.005	0.131	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	7/26/03	7.2	1698	13	121.31	1240	217	54	86	5.1	130	388	0.2	182	<0.015	<0.005	0.132	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	10/01/03	7.1	1820	12	121.83	1220	233	57	90	5.1	133	408	0.2	189	<0.023	<0.005	0.13	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.003	<0.001	<0.01	
ECG917	11/12/03	7.2	1533	12	122.18	1100	214	52	86	4.5	127	400	0.2	189	<0.015	<0.005	0.135	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	12/19/03	7.2	1784	13	122.47	1020	205	55	92	4.2	136	386	0.2	183	<0.015	<0.005	0.136	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	1/17/04	7.1	1585	12	122.5	1050	212	52	83	4.7	137	396	0.3	181	<0.015	<0.005	0.131	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	2/15/04	6.9	1713	12	123.12	1080	214	47	70	3.9	128	378	0.2	185	<0.015	<0.005	0.138	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	3/19/04	7.1	1790	13	123.4	1200	207	52	87	4.4	137	394	0.3	189	<0.015	<0.005	0.13	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	4/21/04	6.9	1786	14	123.69	1120	225	55	90	5.1	136	391	0.2	188	<0.015	<0.005	0.134	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	5/22/04	6.9	1772	14	125.16	1090	232	51	81	4.5	138	386	0.2	180	<0.022	<0.005	0.135	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	10/26/04	6.9	1772	12	125.49	1080	216	67	53	3.7	114	385	0.2	200	<0.015	<0.005	0.136	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	2/21/02	7.3	1680	14	104.33	940	207	34	52	3.6	114	384	0.3	194	<0.015	<0.005	0.134	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	2/22/02	7.4	1430	14	104.55	1040	211	67	55	4	101	383	0.3	196	<0.015	<0.005	0.136	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<0.001	<0.01	
ECG917	12/3/02	7.4	1585	12	105.53	1010	224	69	59	4.9	102	362	0.3	193	<0.015	<0.005	0.135	<0.001	<0.01	<0.02	<0.3	<0.005	<0.01	<0.002	<0.001	<0.01	<0.002	<		

Well	Date	pH	Cond	Temp	D <sub>TW</sub>	TDS	C <sub>a-T</sub>	Mg-T	Na-T	K-T	SO <sub>4</sub>	Cl	F	Aalk	Acidity	Al-D	As-D	Ba-D	Cd-D	Cr-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D (DRC)	Se-D (hyd)	Ag-D	Zn-D	
		su	uS/cm	C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
ECG1115C	6/21/02	4.3	18480	16	338.08	10400	415	3760	153	28800	151	298	<5	1.38	0.001	3.09	0.338	0.0009	1000	0.0028	39.8	0.0009	0.0009	0.00028	0.00028	0.00028	0.00028	72.3	109			
ECG1115C	6/24/03	4.1	19260	15	344.18	38500	400	2050	25.8	34800	156	272	<5	620	0.088	1.91	0.014	9.51	0.416	0.009	1020	<0.0002	42.5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	151		
ECG1115C	9/1/04	3.6	19220	18	374.06	45400	363	6420	92	28.6	31200	163	313	<5	916	<0.02	1.95	<0.02	26	6.38	<0.05	1080	<0.0072	45.7	15.5	15.5	15.5	15.5	15.5	15.5	61.3	
ECG1115A	6/24/02	3.2	14980	19	313.43	25500	420	3760	90	25.5	21800	162	124	<5	1190	0.036	0.589	0.081	61.3	406	<0.05	219	0.0014	15.5	20.5	20.5	20.5	20.5	20.5	20.5	60.9	
ECG1117A	7/1/03	3.4	13100	18	321.11	23000	442	3020	103	3	15100	156	60.5	<5	7040	859	0.02	0.595	0.051	46.4	220	<0.005	203	0.0095	11.3	0.055	0.055	0.055	0.055	0.055	0.055	55.6
ECG1117A	8/27/04	3.4	11840	15	340.05	20100	397	2240	100	2.6	14400	176	95	<5	4880	692	0.018	0.613	0.047	43.3	<0.005	11.3	0.069	0.069	11.3	0.069	11.3	0.069	0.069			
ECG1117B	6/24/02	6.8	3840	18	301.62	4600	798	257	75	8.7	2500	131	91	307	0.784	<0.005	<0.001	<0.01	0.046	<0.3	<0.005	11.3	0.001	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.052		
ECG1117B	7/1/03	7.0	3760	18	310.2	4080	714	242	73	8.3	2800	122	0.1	336	0.05	<0.005	<0.015	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.008	0.008	0.008	0.008	0.008	0.008	0.056		
ECG1117B	8/27/04	6.8	3880	15	330.51	4180	851	255	81	9.4	2340	137	0.3	365	<0.015	<0.005	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.01			
ECG1117B	11/7/02	11830	14	363.43	18800	390	230	97	8	17000	183	104	<5	5110	689	0.031	0.895	<0.01	43.1	<0.005	13.1	0.053	0.053	13.1	0.053	0.053	0.053	0.053	66.5			
ECG1118A	1/24/03	11580	13	384.57	20000	448	2510	120	10	12800	172	103	<5	5670	659	0.026	0.894	0.014	43	37.9	<0.005	279	0.0034	13.3	0.053	0.053	13.3	0.053	0.053	67.8		
ECG1118A	2/20/04	3.4	11080	13	349.47	18600	386	1870	90	6.2	12800	178	97	<5	4450	637	0.025	0.823	<0.01	40.6	72.7	<0.005	11	0.034	0.034	0.034	0.034	0.034	0.034	59.4		
ECG1118B	6/25/02	7.6	3770	18	374.5	502	98.6	30.2	44.3	7.81	181	58	0.2	140	0.304	<0.005	<0.001	<0.01	<0.02	<0.3	<0.005	<0.001	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.02		
ECG1118B	12/7/03	7.7	840	14	376.7	520	96	31	40	6.9	183	60	0.2	135	0.05	<0.005	<0.015	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01		
ECG1118B	2/23/04	7.4	941	15	382.13	620	114	36	41	270	54	0.2	139	0.05	<0.015	<0.005	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.286		
BGS1119B	2/28/02	3.7	9920	17	319	15400	435	1980	140	16.5	12000	204	85.6	<5	254	0.018	1.03	<0.001	12.6	1.335	<0.005	134	0.005	0.005	0.005	0.005	0.005	0.005	0.005	39.1		
BGS1119B	8/23/03	3.6	10180	16	323.37	14300	414	2260	113	11.2	9190	226	1.1	<5	349	0.017	1.04	<0.001	16.6	1.28	<0.005	76.2	0.0062	2.94	0.0062	0.0062	2.94	0.0062	2.94	0.0062	39.1	
BGS1119B	1/28/03	5.3	8460	13	428.95	11500	439	2040	127	13.5	8130	163	32	<5	275	0.011	0.531	<0.01	0.056	<0.3	<0.005	<0.005	147	5.58	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.513
BGS1119B	10/5/03	5.2	8820	15	433.98	11200	429	2150	105	8.1	8150	165	42	<5	23	0.019	0.602	<0.01	0.05	1.1	<0.005	164	0.0079	4.47	0.015	0.015	4.47	0.015	4.47	0.015	0.65	
BGS1119B	6/22/04	4.9	7480	16	434.67	11200	386	1730	99	8.1	8350	166	42	<5	23	0.019	0.689	<0.01	0.078	<0.3	<0.005	156	0.0074	5.97	0.011	0.011	5.97	0.011	5.97	0.011	0.802	
BGS1119B	9/14/04	5.3	9880	15	389	10800	451	1610	96	16.5	7970	167	46.7	<5	177	0.012	0.689	<0.01	0.078	<0.3	<0.005	156	0.0074	5.97	0.011	0.011	5.97	0.011	5.97	0.011	0.802	
BGS1119B	8/21/02	3.7	9920	17	319	15400	435	1980	140	16.5	12000	204	85.6	<5	254	0.018	1.03	<0.001	12.6	1.335	<0.005	134	0.005	0.005	0.005	0.005	0.005	0.005	0.005	28.6		
BGS1119B	7/16/03	7.3	1955	15	291.57	1530	302	79	67	4.7	587	224	0.2	171	0.026	0.026	<0.001	0.001	<0.02	<0.3	<0.005	<0.005	235	0.0025	10.3	0.0093	0.0093	10.3	0.0093	10.3	0.0093	39.1
BGS1119A	9/7/04	3.5	8100	16	327.37	13100	421	1570	117	11.3	9190	207	83	<5	318	0.014	0.65	<0.01	0.048	1.04	<0.005	16.8	0.0074	9.07	0.145	0.145	9.07	0.145	9.07	0.145	29	
BGS1119A	11/8/02	5.2	12620	13	403.69	21900	390	2670	104	17.7	81900	171	120	<5	5270	690	0.045	1.18	<0.01	52.1	31.74	<0.005	367	0.0077	16.3	0.0077	0.0077	16.3	0.0077	16.3	0.0077	63.7
ECG1112A	9/4/03	3.3	12110	31	405.8	21500	451	2240	102	9.1	14900	170	115	<5	5320	675	0.034	1.11	0.065	49.6	37.7	<0.005	338	0.007	14.1	0.051	0.051	14.1	0.051	14.1	0.051	14.1
ECG1112A	8/26/04	3.4	11570	32	409.71	19800	414	2370	95	8.1	14500	173	107	<5	4440	648	0.024	1.14	0.007	47.6	36.4	<0.005	329	0.005	14.1	0.0205	14.1	0.0205	14.1	0.0205	14.1	
BGS1125A	8/2/02	7.2	2040	15	286.54	43450	400	305	85	81	79	218	0.2	256	0.028	0.028	<0.001	<0.01	0.024	<0.3	<0.005	156	0.0074	5.97	0.011	0.011	5.97	0.011	5.97	0.011	0.802	
BGS1125A	8/26/03	7.3	1955	15	291.57	1530	302	79	67	4.7	587	224	0.2	171	0.026	0.026	<0.001	<0.01	0.024	<0.3	<0.005	156	0.0074	5.97	0.011	0.011	5.97	0.011	5.97	0.011	0.802	
BGS1125A	12/22/04	7.1	1940	11	311.86	16100	314	221	82	69	5.9	584	192	0.2	220	<0.015	0.015	<0.001	<0.01	0.024	<0.3	<0.005	156	0.0074	5.97	0.011	0.011	5.97	0.011	5.97	0.011	0.802
HMG1126A	8/15/02	3.6	14980	14	282.21	23200	360	4050	74	15.1	21400	155	194	<5	937	0.054	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005		
BGS1130A	12/22/04	7.2	1680	10	297.83	1320	292	76	55	2.9	528	161	0.2	244	0.015	0.015	<0.005	<0.01	0.025	<0.3	<0.005	156	0.0074	5.97	0.011	0.011	5.97	0.011	5.97	0.011	0.802	
HMG1126B	7/22/04	7.2	1298	10	287.8	920	223	50	48	2.7	533	149	0.2	256	0.012	0.012	<0.005	<0.01	0.025	<0.3	<0.005	156	0.0074	5.97	0.011	0.011	5.97	0.011	5.97	0.011	0.802	
ECG1112A	7/3/02	3.5	17860	17	255.58	43450	400	6030	112	12.																						

Well	Date	pH su	Cond uS/cm	Temp C	DTW ft	TDS mg/l	Ca-T mg/l	Mg-T mg/l	Na-T mg/l	K-T mg/l	SO4 mg/l	Cl mg/l	F mg/l	Alk mg/l	Acidity mg/l CaCO3	AI-D mg/l	As-D mg/l	Ba-D mg/l	Cd-D mg/l	Cu-D mg/l	Fe-D mg/l	Pb-D mg/l	Mn-D mg/l	Hg-T mg/l	Ni-D mg/l	Se-D (DTC) mg/l	Se-D (hyd) mg/l	Ag-D mg/l	Zn-D mg/l
LTG1138	6/14/02	7.3	708	17	517	69	26	63	15.9	34	144				<0.015	0.005	0.122	<0.001	<0.02	<0.3	<0.005	<0.04	<0.002	<0.002	<0.002	<0.01			
LTG1138	9/19/02				532	69	26	68	16.9	30	144				<0.015	<0.005	0.123	<0.001	<0.01	<0.2	<0.005	<0.04	<0.002	<0.002	<0.003	<0.003	<0.001		
LTG1138	2/27/03	7.6	794	9	110.3	513	75	28	58	17.3	32	145			<0.015	<0.005	0.114	<0.001	<0.02	<0.3	<0.005	<0.04	<0.002	<0.002	<0.002	<0.001			
LTG1138	6/5/03	7.5	839	17	110.3	547	72	26	60	15.5	35	148			<0.015	<0.005	0.112	<0.001	<0.01	<0.2	<0.005	<0.04	<0.002	<0.002	<0.003	<0.001			
LTG1138	9/22/03	7.4	2200	21	110.3	540	74	27	60	16	32	144			0.018	0.005	0.122	<0.001	<0.01	<0.2	<0.005	<0.04	<0.002	<0.002	<0.003	<0.001			
LTG1138	12/9/03	7.3	804	15	110.3	550	65	24	54	13.9	32	143			0.021	0.008	0.121	<0.001	<0.01	<0.28	<0.005	<0.13	<0.004	<0.003	<0.003	<0.012			
LTG1138	3/7/04	7.3	789	21	110.3	480	81	29	53	12.1	32	139	0.3	160	<0.015	<0.005	0.126	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.002	<0.001	<0.001			
LTG28/04	7.1	834	18	110.3	550	69	25	45	9.9	30	125	0.3	160	<0.015	<0.005	0.146	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.007	<0.001	<0.001				
LTG1139	9/27/04	7.2	785	18	550	80	25	45	8.9	32	146			0.160	<0.015	0.075	0.135	<0.001	<0.01	<0.2	<0.005	<0.12	<0.002	<0.004	<0.001	<0.001			
LTG1139	12/7/04	7.3	845	12.5	110.3	490	83	27	50	11.4	26	142	0.4	162	<0.02	<0.005	0.134	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.002	<0.001	<0.001			
LTG1140A	6/18/02	7.2	1920	17.5	184	1440	248	78	76	6.6	574	250	0.3	204	<0.015	<0.005	0.497	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
LTG1140A	9/17/03	7.3	2060	14	162.62	1580	282	100	88	6	631	248	0.2	220	<0.015	<0.005	0.407	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.002	<0.011				
LTG1140A	9/26/04	7.0	2250	17.5	199.25	1720	313	86	88	7.6	361	238	0.3	238	<0.015	<0.005	0.412	<0.001	<0.01	<0.2	<0.005	<0.1	<0.001	<0.002	<0.001				
LTG1140B	6/18/02	7.4	731	17	183.8	440	74	25	35	5.6	34	112	0.3	161	<0.015	<0.005	0.416	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
LTG1140B	9/17/03	7.6	717	14	162.42	440	73	37	26	6.6	32	110	0.3	162	<0.029	<0.005	0.401	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
LTG1140B	7/29/04	7.3	735	17.5	188.41	440	77	26	35	6	119	0.4	162	<0.015	<0.005	0.497	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001					
ECG1144A	6/27/02	3.5	11370	17	380.93	19400	428	290	78	9.9	13400	151	101	<5	707	0.024	0.005	0.497	<0.001	<0.01	<0.2	<0.005	<0.1	<0.008	10.9	59.8			
ECG1144A	8/27/03	3.6	10620	16	384.85	1670	508	2160	88	6	631	248	0.2	220	<0.015	<0.005	0.407	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.011				
ECG1144A	8/25/04	3.5	9680	17	387.81	15100	440	1620	74	6.8	9840	176	75.1	<5	517	0.015	0.005	0.412	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	12.1	48.9			
ECG1144B	6/27/02	3.7	12830	17	278.23	21800	414	2860	88	24.5	18300	113	127	<5	469	0.037	0.005	0.415	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001			
ECG1144B	8/27/03	3.8	14200	16	245.88	24500	416	3580	80	12.3	133	123	<5	588	0.033	0.005	0.416	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
ECG1144B	8/27/04	4.0	9710	16	306.84	15100	361	1840	58	14.5	10700	102	87.6	<5	310	0.019	0.005	0.403	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001			
ECG1145A	1/1/5/02	13	216168	21200	428	2740	94	14.9	13500	133	117	<5	5150	708	0.033	0.005	0.418	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
ECG1145A	1/17/03	3.6	12030	13	297.27	3420	673	228	61	9.1	1930	119	0.1	320	<0.015	<0.005	0.401	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
ECG1145A	8/6/04	7.0	3120	17	317.27	16100	380	2030	82	54	7.9	11500	148	97	<5	6300	0.02	0.005	0.401	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001		
ECG1145A	8/30/04	6.8	3030	17	319.13	3220	715	198	52	7.8	1770	616	0.2	338	<0.015	<0.005	0.407	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
ECG1145B	1/1/5/02	4.8	10780	13	288.98	16900	450	2750	123	17.8	18300	144	102	<5	1970	146	0.025	0.564	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001			
ECG1145B	1/17/03	5.3	7120	12	316.31	9030	472	1550	92	10.4	6890	146	19	133	304	25.8	0.005	0.417	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001			
ECG1145B	8/6/04	5.4	5420	17	326.07	7720	470	1020	83	9	5640	116	206	133	206	23.7	0.005	0.418	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001			
ECG1145C	1/1/8/02	7.2	3430	13	297.27	3420	673	228	61	9.1	1930	119	0.1	320	<0.015	<0.005	0.401	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
ECG1145C	1/17/03	7.0	3120	17	317.27	16100	380	2030	82	54	7.9	1920	126	0.2	336	0.02	0.005	0.401	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001			
ECG1145C	8/5/04	6.8	3030	17	319.13	3220	715	198	52	7.8	1770	616	0.2	338	<0.015	<0.005	0.407	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001				
ECG1146	2/8/02	3.4	18770	15	0	42300	440	4450	81	18.2	28600	153	125	<5	12800	1830	0.063	0.864	<0.001	<0.01	<0.2	<0.005	<0.1	<0.002	<0.004	<0.001			
ECG1146	9/19/02	3.4	18670	14	264	4450	4870	85	17.4	35100	160	159	<5	12000	23.6	0.068	0.869	0.013	114	394	<0.005	0.866	0.007	388	0.0075	0.127			
ECG1146	10/30/02	3.5	18670	14	264	4460	4970	72	14	26400	171	158	<5	11900	1650	0.072	0.94	0.014	121	355	<0.005	0.867	0.007	389	0.0066	0.127			
ECG1146	1/24/03	3.2	17860	13	264	40200	457	480	83	16.8	25500	158	187	<5	12100	1580	0.034	0.931	0.011	111	355	<0.005	0.867	0.006	392	0.0068	0.126		
ECG1146	9/2/04	3.2	18300	15	264	4200	435	4420	58	10.7	26500	172	155	<5	12100	1510	0.057	0.864	0.011	103	284	<0.005	0.866	0.006	392	0.0068	0.126		
ECG1146	9/2/04	3.2	18620	15	264	428	436	4230	59	12.5	26800	153	158	<5	12800	1610	0.047	0.884	0.017	96.3	306	<0.005	0.884	0.006	392	0.0068	0.126		
ECG1146	9/2/04	3.2	18620	15	264	436	439	4300	90	12.5	24700	161	162	<5	12000	1760	0.049	0.895	0.021	99	298	<0.005	0.895	0.006	392	0.0068	0.126		
ECG1146	9/2/04	3.2	18620	14	264	38400	356	3930	64	11.8	28100	165	149	<5	12400	1480	0.036	0.895	0.021	99	293	<0.005	0.895	0.006	392	0.00			



Well	Date	pH	Cond	Temp	D <sub>TW</sub>	TDS	C <sub>a-T</sub>	Mg-T	Na-T	K-T	S <sub>O4</sub>	Cl	F	Alk	Acidity	A <sub>L-D</sub>	B <sub>a-D</sub>	C <sub>b-D</sub>	D <sub>c-D</sub>	E <sub>d-D</sub>	F <sub>e-D</sub>	G <sub>f-D</sub>	Hg-T	Mn-D	Pb-D	Mn-D	Hg-T	S <sub>e-D</sub>	S <sub>e-D</sub> (HgC)	S <sub>e-D</sub>	S <sub>e-D</sub> (AgD)	Zn-D	
		su	uS/cm	C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l			
BSG1179B	2/21/03	12	393.8	12700	441	1620	85	135	74	69	9110	144	69	300	0.018	0.024	0.027	0.011	0.011	0.011	0.011	0.065	171	0.0073	8.24								
BSG1179B	8/8/00	12	393.8	11800	437	1590	78	16.9	86	53	120	144	69	0.855	0.013	5.95	<0.3	0.07	147	0.0099	5.74	0.024							35.1				
BSG1179B	10/14/03	14	400.98	11800	437	1590	86	18.4	8500	137	64	120	144	69	0.855	0.013	5.95	<0.3	0.066	144	0.0081	5.68	0.421							34.1			
BSG1179B	3/25/04	15	406.71	11200	457	1460	86	12.8	20400	33	134	120	120	120	0.038	0.748	<0.1	0.013	261	0.0012	17.3							26.6					
BSG1179C	7/15/02	3.7	14730	17	387.39	28000	397	3240	60	12.8	20800	151	123	45	8860	1080	0.031	0.863	<0.01	72.9	243	0.009	230	0.0032	15.1					100			
BSG1179C	2/20/03	3.8	13670	13	388.45	28000	445	3200	67	13	20800	151	123	45	8860	1080	0.031	0.863	<0.01	72.9	243	0.009	230	0.0032	15.1					88.9			
BSG1179C	3/24/04	3.6	13270	15	411.13	27600	402	3160	56	10.4	18100	147	130	45	7720	1120	0.022	0.67	<0.01	71.6	180	0.0041	223	0.0041	14.4					82.5			
BSG1180B	10/3/02	12	393.8	12700	4470	127	19600	166	125	22.8	18000	168	199	45	6750	943	0.084	2.37	0.014	2.71	<0.3	0.048	517	0.0208	25.5						94.4		
BSG1180B	1/29/03	3.1	15810	13	371.84	28900	417	4450	110	115	18.3	18200	196	194	45	6890	820	0.071	1.887	0.014	3.35	<0.3	0.043	905	0.0222	24.7						89.6	
BSG1180B	10/15/03	3.6	15590	14	379.39	28600	420	4110	110	115	20300	165	172	45	5570	785	0.083	2	0.014	2.84	<0.3	0.037	435	0.0209	20.2	0.064	1.36					83.6	
BSG1180B	3/1/04	3.7	15430	14	362.32	25500	374	4490	111	16.1	20300	165	172	45	4520	657	0.048	2.01	0.012	3.03	<0.3	0.04	440	0.0273	20.3	0.044	6.61					62.7	
BSG1180B	5/19/04	3.7	14070	15	407.0	28600	411	4590	125	19.8	16100	161	163	45	4460	573	0.045	1.99	0.011	2.88	<0.3	0.037	384	0.0222	19.6						64.8		
BSG1180C	10/2/02	8.7	528	1160	148	8.7	4850	150	152	30.2	252	114	10.07	11.4	0.007	0.117	<0.01	0.21	0.021	0.005	96.1								0.22				
BSG1180C	1/26/03	6.210	12	365.62	7320	551	1090	158	8.9	4820	154	31	255	13	<0.005	0.118	<0.01	0.02	<0.3	<0.005	94.6	0.0231								0.24			
BSG1180C	2/26/04	6.1	6280	13	376.56	9320	503	1320	138	7.5	6910	157	472	198	26.7	<0.005	0.239	<0.1	0.021	<0.3	<0.005	142	0.0226	5.12	0.022	0.236					0.786		
ECG1183A	3/4/02	8.6	4280	2790	466	219	8.3	910	80	889	311	296	8.6	0.006	<0.001	0.021	<0.02	0.007	<0.005	<0.005	0.007	0.0242								<0.01			
ECG1183A	9/23/02	8.7	4230	2380	418	129	115	700	8.5	713	296	194	8.6	0.65	0.009	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01		
ECG1183A	3/31/03	6.7	3330	15	44.43	2580	483	126	202	6.1	728	677	0.2	294	0.03	0.006	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.015	<0.005								<0.01	
ECG1183A	11/25/03	7.0	2850	10	43.25	2380	432	109	168	573	672	0.3	276	0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.015	<0.005								0.236		
ECG1184	6/6/04	6.7	3480	12	39.84	2830	489	115	183	7.4	731	700	0.3	308	0.032	0.006	<0.001	<0.01	<0.02	0.006	<0.005	<0.005	0.022	<0.005								0.24	
ECG1184	12/14/04	6.7	3880	13.5	42.94	2490	541	124	196	7.1	708	683	0.4	307	<0.02	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								0.24	
ECG1184	2/4/02	7.0	1480	15	40.52	1080	168	95	66	3.1	358	130	0.8	287	0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	5/28/02	6.9	1250	13.5	42.1	906	119	73	53	2.7	335	97	0.9	288	<0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	9/7/03	7.0	1268	9	44.13	886	126	83	57	2.8	327	100	0.5	275	0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	12/4/02	7.0	1228	11	42.88	880	130	66	53	2.6	325	90	0.8	285	<0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	5/15/03	7.0	1480	15	40.52	1080	168	95	66	3.1	358	130	0.8	287	<0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								0.24	
ECG1184	7/1/03	7.1	1276	13	46.46	928	133	72	51	2.5	268	89	0.8	284	0.043	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	12/17/03	6.9	1160	10	44.15	833	116	64	48	2.4	302	84	0.8	284	0.013	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	3/8/04	6.9	1322	13	43.37	937	147	77	57	2.7	327	96	0.8	285	<0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	5/20/04	6.9	1389	13	41.06	1150	150	78	61	2.9	361	114	0.8	285	<0.015	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	9/16/04	7.0	1447	13	49.13	191	86	61	3	3.68	148	125	0.8	281	<0.02	0.005	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	11/7/02	6.9	1413	10	44.01	1010	150	334	71	131	4.3	594	392	0.2	204	0.016	0.006	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								0.24
ECG1184	4/8/02	7.0	1170	14	487	395	1670	328	134	4.8	485	386	0.2	202	0.016	0.006	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	11/21/03	7.1	1889	12	42.5	1490	302	68	128	4.4	440	401	0.2	202	0.016	0.006	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	2/16/04	7.0	2070	12	43.18	1560	303	63	113	4	511	368	0.3	191	0.018	0.006	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	6/8/04	6.8	1930	14	43.29	1470	281	61	115	4.2	422	376	0.2	197	0.018	0.006	<0.001	<0.01	<0.02	0.005	<0.005	<0.005	0.022	<0.005								<0.01	
ECG1184	8/23/04	7.0	1816	14	44.06	1620	284	59	115	4.1	482	377	0.2	193	0.015	0.005																	

Well	Date	pH	Cond	Temp	DTW	TDS	Ca-T	Mg-T	Na-T	K-T	SO4	Cl	F	Alk	Acidity	Al-D	Ba-D	Cd-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D	Zn-D	
		su	uS/cm	C	FI	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l							
ECG1188	1/6/02	6.9	246	6.8	724	142	238	6	1640	469	0.2	285	<0.015	0.005	0.031	<0.001	<0.02	<0.005	<0.01	<0.04	<0.04	<0.003	<0.001	<0.002	<0.001	<0.01		
ECG1188	4/26/02	6.8	3560	696	139	246	432	238	283	283	0.2	285	<0.015	0.006	0.03	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01		
ECG1188	7/1/02	6.8	3860	16	38.97	350	773	156	268	482	0.2	279	<0.015	0.005	0.03	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01		
ECG1188	10/31/02	7.0	3630	12	39.72	344	745	151	256	7.9	1580	492	0.2	271	<0.015	0.005	0.03	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1188	1/14/03	7.1	3700	13	40.12	340	735	140	240	7.9	1600	484	0.2	274	<0.015	0.005	0.03	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1188	5/6/03	7.1	3710	13	40.82	350	610	137	220	5.3	1650	478	0.2	283	<0.015	0.005	0.03	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1188	9/4/03	6.9	3790	12	42.63	3470	736	145	258	6.4	1750	487	0.2	274	0.024	<0.005	0.028	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1188	10/30/03	7.0	3780	12	42.63	3470	736	145	258	6.4	1750	487	0.2	267	<0.015	<0.005	0.028	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1188	1/9/04	7.0	3850	13	42.61	3440	694	134	238	6.1	1770	450	0.4	275	0.022	<0.005	0.03	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1188	4/23/04	6.9	3710	14	43.18	3580	701	135	235	6.4	1670	473	0.2	277	<0.015	<0.005	0.031	<0.001	<0.01	<0.028	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1188	8/27/04	6.6	3980	14	40.2	3550	711	132	237	5.9	1640	489	0.3	276	<0.02	<0.027	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01	
ECG1188	11/17/04	7.0	3500	12	44.37	3390	732	135	236	6.1	1630	488	0.2	279	<0.015	<0.005	0.034	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	1/7/02	7.6	991	13	25.23	575	133	231	5.8	1640	478	0.2	279	<0.015	<0.005	0.031	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01	
ECG1189	5/24/02	7.5	942	13	25.06	638	119	34	32	4.7	16	222	0.3	131	0.024	<0.005	0.038	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	7/3/02	7.2	966	15	22.07	610	96	35	34	6	202	0.3	124	0.025	<0.005	0.0328	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01	
ECG1189	10/31/02	7.6	896	12	22.03	599	95	34	29	4.1	15	222	0.3	131	0.025	<0.005	0.0325	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	1/9/03	7.7	947	12	22.07	751	114	35	34	5.3	17	212	0.3	137	0.015	<0.005	0.0324	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	5/6/03	7.6	943	14	22.03	620	80	31	28.6	4	213	0.2	133	0.015	<0.005	0.0327	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01	
ECG1189	9/3/03	7.5	852	14	22.58	620	120	33	21	4.7	214	0.3	130	0.015	<0.005	0.0327	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01	
ECG1189	10/28/03	7.6	907	14	22.51	610	117	35	31	4.8	16	218	0.3	132	0.015	<0.005	0.033	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	1/9/04	7.2	953	14	22.42	580	110	34	32	4.8	17	198	0.3	129	0.015	<0.005	0.0329	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	4/23/04	7.6	924	14	22.52	560	111	33	31	5	15	209	0.3	132	0.019	<0.005	0.0358	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	8/26/04	7.3	1000	13	22.61	630	119	33	29	4.5	12	211	0.3	132	0.019	<0.005	0.0371	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1189	11/30/04	7.5	954	11	22.54	627	117	34	30	4.6	206	0.3	133	<0.02	<0.005	0.0353	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01	
ECG1190	1/6/02	7.0	850	14	128.41	850	182	43	27	3	60	289	0.3	180	0.023	<0.006	0.0165	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	7/1/02	7.1	1221	15	127.41	774	168	46	33	4.6	49	272	0.3	156	0.015	<0.005	0.0161	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	10/31/02	7.4	1109	12	127.21	744	169	47	31	4.7	49	278	0.3	156	0.015	<0.005	0.0162	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	1/9/03	7.5	1190	13	122.07	960	182	44	29	3.4	58	262	0.3	158	0.015	<0.005	0.0165	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	4/10/03	7.4	1085	14	128.42	870	174	44	25	3.1	54	277	0.3	155	<0.015	<0.005	0.0164	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	10/30/03	7.3	1243	13	128.53	855	163	44	27	3	60	284	0.3	157	<0.016	<0.005	0.0164	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	7/1/04	7.2	1232	13	128.42	780	157	43	27	3	60	285	0.3	155	0.015	<0.005	0.0161	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	4/13/04	7.1	1246	14	128.54	825	165	45	28	3.3	49	278	0.3	157	0.019	<0.005	0.0163	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	8/26/04	7.1	1324	13	130.21	850	183	44	26	2.8	52	285	0.3	158	<0.015	<0.005	0.0159	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
ECG1190	11/17/04	7.2	1126	12	130.57	790	165	42	25	3.8	53	282	0.3	156	<0.02	<0.005	0.0158	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01
LTG1191	1/16/02	6.1	4890	14	23.2	4860	522	237	8.4	249	249	2.9	316	<0.015	<0.006	0.02	0.082	<0.001	<0.02	<0.3	<0.05	<0.01	<0.04	<0.003	<0.001	<0.002	<0.01	
LTG1191	1/17/02	6.6	5010	13	23.97	4810	567	451	262	9	3160	380	3.1	312	0.55	<0.005	0.02	0.086	<0.001	<0.024	<0.3	<0.05	<0.01	<0.04</				

Well	Date	pH	Cond	Temp	DTW	TDS	Ca-T	K-T	SO4	F	Alk	mg/l CaCO3	Acidity	Al-D	As-D	Ba-D	Cd-D	Cr-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D (DTC)	Ag-D	Zn-D	
		su	uS/cm	C	Fl	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l							
B2G1193	11/1/03	7.3	2850	14	380.63	3040	565	223	84	4.5	1770	189	216	<0.01	<0.01	<0.3	<0.05	<0.01	<0.1	<0.02	<0.01	<0.05	<0.01	<0.01	<0.01	0.016	0.016		
B2G1193	12/21/03	6.9	3280	14	380.63	3040	535	210	79	4.5	1710	179	213	<0.015	0.008	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	1/28/04	7.2	3240	19	390.63	3050	537	209	79	4.5	1940	183	212	<0.049	0.011	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	2/4/04	6.9	3020	14	380.63	3010	542	221	87	4.5	1700	184	218	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	3/4/04	6.9	3140	15	380.63	3110	551	225	86	4.6	1830	177	214	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	3/25/04	7.0	3230	15	380.63	3220	584	245	83	4.8	2010	185	221	<0.089	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	4/16/04	7.1	2440	14	380.63	3020	540	223	87	5	1670	174	211	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	7/16/04	6.7	2770	16	390.63	3040	542	188	74	4.1	1950	180	215	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	8/4/04	6.7	2580	16	390.63	3009	555	210	81	4.8	1630	172	216	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	9/16/04	7.1	3600	15	390.63	3030	551	214	73	4.4	1760	188	217	<0.016	<0.006	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	10/15/04	7.1	2970	443	3120	552	211	71	4.2	1640	170	212	<0.02	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016		
B2G1193	11/1/04	7.0	2950	15	390.63	3090	548	219	79	4.6	1760	187	219	<0.02	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B2G1193	12/10/04	7.0	2970	17	390.63	3150	557	223	87	5	1670	173	221	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195A	7/19/02	6.7	2860	16	390.63	2750	553	154	99	5.4	1540	181	215	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195A	9/18/03	6.9	2790	15	433.33	2620	515	142	89	4.2	1460	183	226	<0.032	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	2/19/04	7.0	2750	12	424.57	2620	533	143	88	4.2	1540	181	220	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	7/19/02	7.4	1977	16	371.68	7870	459	1230	114	6.5	5720	137	236	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	9/16/03	7.1	2080	16	380.63	1600	284	75	55	3.1	762	179	240	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	7/27/04	7.0	1988	16	430.03	1760	370	93	66	3.3	972	146	213	<0.016	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	11/5/02	6.3	7640	14	354.73	9475	479	1430	125	6	7000	176	208	<0.015	0.006	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	6/18/03	6.3	6530	15	356.53	9450	434	1530	118	4.8	1520	183	213	<0.015	<0.006	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	12/3/03	6.3	6930	14	364.05	8560	448	1490	119	6.9	5980	138	222	<0.021	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195B	6/28/04	6.4	6430	16	371.68	7870	459	1230	114	6.5	5720	137	212	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195C	11/6/02	6.5	5980	14	352.39	6740	733	805	155	7	4910	171	99	<0.016	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195C	12/4/03	6.4	5380	14	362	7010	755	96	189	6.9	4560	161	326	<0.016	<0.006	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
BFG1195C	7/11/04	7.5	927	12	312.24	6227	116	38	41	3.1	212	92	153	<0.005	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B3G1197A	2/11/02	7.5	927	17	1067	770	121	45	48	4.1	271	96	154	<0.006	<0.006	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B3G1197A	3/14/02	7.5	1025	321.42	724	108	41	40	3.1	278	98	154	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016		
B3G1197A	9/13/02	7.2	870	127	43	43	3	283	103	0.1	149	153	153	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B3G1197A	10/25/02	7.6	1019	14	321.81	690	131	48	56	5.8	258	101	153	<0.026	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B3G1197A	11/22/02	7.6	971	14	320.53	760	120	42	2.3	238	173	0.2	150	<0.029	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B3G1197A	12/1/02	7.5	905	13	319.75	663	124	43	46	3.6	234	97	152	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	
B3G1197A	7/7/03	7.7	898	13	318.24	630	103	43	44	3.7	208	94	0.2	146	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016
B3G1197A	2/19/03	7.7	859	13	322.47	528	109	38	47	3.9	177	98	0.2	154	<0.015	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016
B3G1197A	3/26/03	7.2	870	127	43	43	3	283	103	0.1	149	153	153	<0.057	<0.005	<0.01	<0.01	<0.02	<0.3	<0.05	<0.01	<0.0002	<0.04	<0.04	<0.01	<0.01	0.016	0.016	

Well	Date	pH	Cond	Temp	D <sub>TW</sub>	TDS	Ca-T	Mg-T	Na-T	K-T	SO <sub>4</sub>	Cl	F	Alk	Acidity	Al-D	As-D	Ba-D	Cd-D	Cr-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D (DRC)	Se-D (hyd)	A-g-D	Zn-D
		su	uS/cm	C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
BFG1200	11/5/02	7.7	2010	14	1740	335	107	66	4.2	919	923	154	0.1	145	0.1	178	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	4.82	0.0088	0.117	0.059	<0.01		
BFG1200	2/19/03	7.4	2020	15	1630	352	106	68	4.3	923	154	0.1	183	<0.015	0.006	183	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.004	<0.01	<0.01	<0.01		
BFG1200	6/13/03	7.2	1975	16	1670	317	95.3	58	3.7	1010	155	0.2	177	<0.015	0.006	177	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
BFG1200	8/18/03	7.2	2030	15	1770	305	100	62	3.8	863	157	0.2	180	<0.015	<0.005	180	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
BFG1200	12/9/03	7.2	2010	15	1710	319	92	59	3.5	904	156	0.2	179	10.03	0.008	179	<0.001	<0.013	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
BFG1200	2/4/04	7.0	200	14	1710	324	96	65	4	815	162	0.2	181	<0.015	0.007	181	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.004	<0.01	<0.01			
BFG1200	6/28/04	7.1	1942	16	1540	295	87	67	58	4	798	158	0.2	187	<0.015	0.007	187	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.004	<0.01	<0.01		
BFG1200	9/13/04	7.0	2000	16	1740	353	90	58	3.3	914	165	0.2	185	0.015	0.008	185	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
BFG1200	9/6/04	7.2	2230	170	354	96	60	3.8	909	163	0.2	185	<0.015	0.006	185	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01				
BFG1200	12/1/04	7.1	2100	14	1750	344	96	60	3.6	893	166	0.2	186	<0.02	0.005	186	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
HM6186	8/15/02	7.2	2300	65	1380	230	65	118	15.1	299	320	0.2	295	<0.015	<0.005	295	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
BGS1177C	2/11/03	7.4	1014	13	384.79	720	144	46	36	3.9	298	84	0.2	147	<0.015	<0.005	147	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.004	<0.01	<0.01		
BGS1177C	3/10/04	7.4	1179	14	395.52	920	50	33	3.4	390	88	0.2	146	<0.015	<0.005	146	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
W41A	3/8/02	6.8	1158	17	907	150	64	59	2.9	230	102	0.3	286	<0.015	<0.005	286	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
W41A	6/14/02	6.8	1158	17	900	168	65	57	3.7	281	87	0.3	287	0.03	0.005	287	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
W41A	9/19/02	7.1	1902	12	955	8	13	769	117	56	52	3.2	242	71	0.3	286	<0.015	<0.005	286	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01
W41A	12/20/02	7.2	2002	12	955	8	13	769	117	56	52	3.2	242	71	0.3	286	<0.015	<0.005	286	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01
W41A	3/28/03	7.2	1098	8	810	144	57	51	3.6	250	81	0.3	302	0.089	<0.005	302	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01			
W41A	6/27/03	6.9	1431	17	1300	19	13	860	156	58	53	2.7	274	111	0.3	296	0.086	0.006	296	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01
W41A	9/28/03	7.2	1300	19	1300	19	13	860	156	58	53	2.7	281	111	0.3	296	<0.015	<0.005	296	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01
W41A	12/24/03	7.1	1056	10	311	710	136	50	45	2.9	198	60	0.2	267	<0.015	<0.005	267	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
W41A	3/30/04	6.9	1179	11	13	850	160	64	56	3	287	97	0.2	308	<0.015	<0.005	308	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
W41A	5/21/04	7.0	1454	15	13	1160	188	71	66	3.1	158	135	0.3	303	<0.015	<0.005	303	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
W41A	9/28/04	7.0	1382	18	1382	18	17	1010	174	56	53	2.8	294	132	0.2	297	<0.02	<0.005	297	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01
W41A	12/21/04	6.9	1172	7	13	850	148	60	56	2.9	240	87	0.4	300	<0.02	<0.005	300	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
W71	6/11/03	7.3	1466	14	95	980	182	44.9	64	9.5	87	302	0.2	227	<0.015	<0.005	227	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
W71	9/19/03	7.1	914	8	595	117	31	54	8.6	51	51	151	0.2	208	0.006	<0.005	208	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
W71	12/28/03	7.3	689	7	135	470	82	21	40	6.9	35	94	0.2	186	<0.015	<0.005	186	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
W71	3/28/04	7.1	752	11	135	450	94	23	43	7.3	46	106	0.2	188	<0.015	<0.005	188	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
P197B	7/2/02	7.1	2760	16	41.67	2415	486	138	120	11.1	1280	225	0.1	207	<0.015	<0.005	207	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
P197B	2/25/04	6.9	2380	13	413.55	2030	386	107	77	3.7	984	243	0.2	195	<0.015	<0.005	195	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
P209B	12/23/03	6.9	3780	13	394.08	3970	809	219	117	5.2	2520	181	0.2	247	<0.02	<0.005	247	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
P277	10/19/04	6.6	3540	17	404.98	3870	805	187	103	4.7	2090	187	0.2	247	<0.02	<0.005	247	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
P277	10/15/03	6.9	3280	14	345.63	3000	661	173	102	5	1750	194	0.2	242	<0.015	<0.005	242	<0.001	<0.01	<0.02	<0.3	<0.005	<0.1	<0.002	<0.04	<0.01	<0.003	<0.01	<0.01		
P277	3/23/04	6.8	3080	15	350.56	2820	621	166	98	4.4	1860	186	0.2	233	<0.015	<0.005	233	<0.001	<0.01	<0.02</td											

Well	Date	pH	Cond	Temp	DTW	TDS	Ce-T	Mg-T	Na-T	K-T	SO4	Cl	F	Alk	Acidity	Al-D	A-S-D	Ba-D	Cd-D	Ca-D	Cl-D	Cr-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D (FRC)	Ag-D	Zn-D
		su	uS/cm	C	Fl	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l									
BSG1153B	12/20/04	7.8	491	13	362.85	330	61	19	26	4.7	36	48	0.3	146	0.103	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01		
BFG1156B	2/20/03	7.2	3300	13	403.92	3230	767	204	95	5.8	2010	169	232	0.1	219	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.007	<0.01	
BFG1156B	3/10/04	6.9	3140	15	404.33	3180	656	176	83	4.6	1880	173	232	0.2	219	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.007	<0.01	
BFG1156C	8/6/02	3.6	3180	15	402.32	3110	646	173	91	5.7	1710	178	232	0.1	216	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01	
BFG1156C	2/4/03	7.2	3010	13	403.57	2880	615	179	95	5.8	1670	188	234	0.1	216	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.019	
BFG1156C	3/8/04	7.0	2830	15	404.83	2740	562	146	81	4.2	1580	202	216	0.2	216	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.029	
BFG1156D	2/6/03	7.5	13	403.93	981	184	56	52	4.6	420	119	148	0.3	144	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01		
BFG1156D	3/8/04	7.1	1541	15	404.95	1280	216	64	50	3	584	116	0.2	144	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01		
BZG1157A	2/1/03	7.2	2730	12	422.03	2710	540	146	91	5.7	1830	138	211	0.2	211	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.007	<0.016	
BZG1157A	10/8/03	6.9	2890	15	427.2	2750	563	151	90	4.9	1580	145	204	0.2	204	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.01	
BZG1157A	11/1/03	7.0	2610	13	426.57	2790	580	153	89	4.4	1670	153	209	0.2	209	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.01	
BZG1157A	16/04	6.9	3080	10	384.69	2890	597	157	91	4.7	1600	151	215	0.2	215	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.01	
BZG1157A	2/4/04	6.8	2840	12	424.93	2840	576	156	89	4.5	1580	147	212	0.2	212	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	3/4/04	6.8	2840	13	422.88	2870	588	161	95	5.7	1830	144	218	0.2	218	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	4/16/04	6.8	3130	14	421.75	2860	596	161	95	5.7	1830	144	223	0.2	223	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	6/8/04	6.8	3120	15	420.57	3000	642	162	94	4.8	1720	143	223	0.2	223	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	7/16/04	6.8	2860	16	424.2	2860	624	149	88	4.4	1900	134	228	0.2	228	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	8/3/04	6.8	2740	14	426.52	2830	612	152	87	4.4	1670	143	218	0.2	218	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	9/7/04	7.2	3540	13	427.12	2910	610	154	87	4.7	1610	145	220	0.2	220	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	10/15/04	7.2	2820	12	426.85	2800	634	155	85	4.5	1630	144	222	0.2	222	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	11/1/04	7.2	2830	12	426.57	2850	631	158	89	4.6	1630	141	223	0.2	223	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157A	12/1/04	7.2	2830	13	426.57	2850	631	158	89	4.6	1630	141	231	0.2	231	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157B	10/9/03	6.9	5380	16	430.73	6330	544	97	87	93	5.6	4400	151	341	0.3	341	0.006	0.024	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01
BZG1157B	11/1/03	7.0	4830	13	429.75	6370	549	984	95	4.6	4580	161	341	0.2	348	0.033	0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157B	1/5/04	6.9	5630	12	426.08	6780	534	800	73	4.5	4200	149	349	0.2	349	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157B	2/5/04	6.8	5640	12	427.85	6670	530	800	73	4.5	4680	148	352	0.2	352	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157B	3/4/04	6.8	5680	15	425.77	6870	540	1000	101	6.3	4770	147	352	0.3	350	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157B	4/16/04	6.8	4380	15	424.93	6810	548	959	100	6.5	4690	148	364	0.3	362	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157B	7/16/04	6.8	5840	16	424.83	6970	579	999	103	6.1	4830	148	369	0.3	359	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157B	7/16/04	7.6	5989	14	429.86	370	73	26	32	2.6	46	77	158	352	0.025	0.006	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01		
BZG1157C	10/10/03	7.5	640	13	429.92	7070	577	1030	101	6.2	5210	149	361	0.2	361	<0.015	<0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.01	
BZG1157C	10/16/04	7.1	6383	12	420.86	7160	522	106	58	38	2.8	4860	148	356	0.2	356	<0.015	<0.005	<0.001	<0.001	<0.001	&lt									

Well	Date	pH	Cond	Temp	DTW	TDS	Ca-T	Mg-T	Na-T	K-T	SO4	Cl	F	Alk	Acidity	Al-D	As-D	Ba-D	Fe-D	Cd-D	Cr-D	Cu-D	Mn-D	Hg-T	Se-D	Se-D (DRC)	Ni-D	Pb-D	Ag-D	Zn-D	
		su	uS/cm	C	ft	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l		
BGS1201	6/22/04	3.5	11780	13	17800	363	2150	88	113800	152	102	<5	3860	421	0.02	0.842	0.52	0.02	0.78	<0.01	21	25.4	0.039	204	0.0064	10.4	0.188	51			
BGS1201	12/1/04	3.5	9880	14	18600	423	2070	94	113600	164	92.9	<5	3240	452	0.02	0.086	<0.001	0.012	<0.02	<0.005	<0.01	<0.002	<0.001	9.6	0.116	0.0066	9.6	0.0066	47.2		
ABC08	6/24/02	6.5	1886	17	215.4	1530	245	107	80	3.3	680	109	412	3240	452	0.02	0.086	<0.001	0.012	<0.02	<0.005	<0.01	<0.006	<0.001	0.006	<0.002	<0.001	0.03			
P255A	9/29/03	6.7	2330	16	60.35	180	258	98	224	5.5	811	224	0.1	312	0.178	<0.005	<0.001	<0.01	<0.02	<0.005	<0.01	<0.005	<0.001	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001		
P255A	3/5/02	6.7	1080	135	80	84	4.4	417	139	247	0.115	0.005	<0.001	0.025	<0.02	<0.005	<0.01	<0.04	<0.002	<0.005	<0.01	<0.005	<0.001	<0.002	<0.001	<0.001	<0.001				
P255A	9/23/03	6.7	1750	19	39.56	1170	209	58	153	4.7	257	269	0.2	276	0.115	<0.005	<0.001	0.025	<0.02	<0.005	<0.01	<0.04	<0.002	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001		
P256	3/28/03	7.0	2100	14	48.85	1800	346	111	69	4.6	770	178	0.1	377	0.019	0.008	<0.001	<0.01	<0.027	<0.005	<0.01	<0.04	<0.002	<0.001	<0.006	<0.001	<0.002	<0.001	<0.001		
P256	9/23/03	6.9	2900	16	<1.75	2480	371	122	234	6	1000	363	0.1	209	<0.015	0.007	0.014	<0.001	<0.011	<0.02	<0.005	<0.01	<0.04	<0.024	<0.001	<0.001	<0.001	<0.001	<0.023		
P259	9/23/03	7.1	1280	17	162.92	860	107	56	129	7.6	191	189	0.4	254	0.146	<0.005	0.021	<0.001	0.011	<0.02	<0.005	<0.01	<0.04	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001		
P261	3/12/02																														
W235	3/28/03	7.2	2850	18	2100	407	107	85	120	903	0.1	179	0.15	<0.005	<0.01	<0.001	<0.001	<0.01	<0.02	<0.005	<0.01	<0.04	<0.009	<0.001	<0.001	<0.001	<0.001	<0.001			
W408	6/14/02	7.0	1189	16	1120	166	53	54	56	255	150	0.2	275	<0.015	0.006	<0.001	<0.01	0.03	<0.005	<0.01	<0.04	<0.002	<0.001	<0.006	<0.001	<0.001	<0.001	<0.001			
W408	6/19/03	7.1	1287	16	220	900	181	51.1	49	4.6	250	152	0.2	287	<0.015	<0.005	<0.001	<0.01	0.031	<0.005	<0.01	<0.04	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001		
W408	12/21/04	7.1	1222	5	220	880	187	52	54	4.8	187	141	0.3	285	0.04	<0.005	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001		
HMG1163A	6/24/03	6.7	2040	14	14.44	1860	371	98.8	85	4.6	931	282	0.1	269	<0.015	<0.005	<0.001	0.027	<0.02	<0.005	<0.01	<0.04	<0.009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
BGS1180A	10/4/02																														
BGS1180A	1/3/03	7.0	3780	12	366.56	3620	618	210	204	6	2010	163	0.2	362	<0.015	<0.005	<0.001	<0.01	<0.02	<0.005	<0.001	<0.04	<0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
BGS1180A	3/4/04	6.8	3600	13	377.77	3560	667	120	187	5.3	2120	157	0.2	345	0.03	<0.001	<0.001	<0.001	<0.01	<0.02	<0.005	<0.001	<0.04	<0.007	<0.001	<0.001	<0.001	<0.001	<0.001		
ECG1183B	3/4/02																														
ECG1183B	9/23/02																														
ECG1183B	3/21/03	7.1	2030	15.5	33.82	1380	229	81	101	9.6	136	495	0.2	181	0.04	<0.005	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.003	<0.001	<0.001	<0.001		
ECG1183B	11/25/03	7.2	1881	14	34.86	1330	219	75	94	8.8	133	509	0.2	178	<0.015	<0.005	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.003	<0.001	<0.001	<0.001		
ECG1183B	6/9/04	7.0	2060	17	32.27	1340	224	73	92	8.7	148	494	0.2	183	<0.015	<0.005	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.005	<0.001	<0.001	<0.001		
ECG1183B	12/14/04	7.0	2120	15	33.12	1250	248	76	90	8.4	182	482	0.3	183	0.006	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001		
ECG1114A	9/23/03	7.0	911	19	33.82	650	90	35	64	13.7	51	182	0.1	171	0.006	<0.214	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	
ECG1114B	11/4/04	7.4	1016	16	40.33	622	93	34	66	13.6	180	180	0.1	169	0.006	0.248	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.015	<0.001	<0.001	<0.001	<0.001	
ECG1114B	9/24/03	7.4	387	18	38.55	524	46	15	13	26	41	115	0.2	181	0.004	0.204	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	
ECG1114B	11/5/04	7.5	419	15	386.07	240	52	16	15	2.9	23	41	0.2	122	0.001	0.227	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.014	<0.001	<0.001	<0.001	<0.001	
ECG1182A	12/3/03	8.0	795	17	48.46	520	18	6	158	7.2	85	198	0.2	186	<0.005	0.006	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.016	<0.001	<0.001	<0.001	<0.001	
ECG1182B	12/2/03	7.3	901	18	42.21	600	106	40	43	38	32	145	0.1	120	0.006	0.209	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.013	<0.001	<0.001	<0.001	<0.001	
W31	12/10/04	7.1	987	16	44.97	540	600	97	36	32	9.1	31	145	0.1	191	0.009	0.191	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.015	<0.001	<0.001	<0.001	<0.001
W31	2/12/02																														
W31	4/11/02																														
W31	8/26/02																														
W31	11/19/02	7.5	826	10	140	540	92	37	34	10.2	22	149	0.1	177	0.008	0.166	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.013	<0.001	<0.001	<0.001	<0.001	
W31	2/26/03	7.7	893	7	140	580	106	42	36	12	28	173	0.1	189	0.007	0.223	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.015	<0.001	<0.001	<0.001	<0.001	
W31	6/9/03	7.3	925	17	140	590	110	42	28	5.9	31	185	0.1	191	0.009	0.219	<0.001	<0.01	<0.02	<0.005	<0.001	<0.01	<0.04	<0.002	<0.001	<0.016	<0.001	<0.001	<0.001	<0.001	
W31	8/19/03	7.3	893	14	140	560	93	34	28	7.9	24	149	0.1	185	0.008																

		pH	Cond	Temp	D/W	TDS	Ca-T	Mg-T	Na-T	K-T	SO4	Cl	F	AIk	Acidity	Al-D	Ba-D	Cd-D	Cr-D	Cu-D	Fe-D	Pb-D	Mn-D	Hg-T	Ni-D	Se-D	Se-D (DRC)	Ag-D	Zn-D		
Well	Date	su	us/cm	C	Fl	mgl	mgl	mgl	mgl	mgl	mgl	mgl	mgl	mgl	mg/l CaCO <sub>3</sub>	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
2272	12/27/04	7.0	3670	8	78.12	3530	713	164	200	12.8	288	494	162	0.005	<0.001	<0.01	<0.02	<0.03	<0.05	<0.04	<0.04	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
3/1/02	7.6	776	13	150.13	511	90	33	16	4.9	9	151	151	165	0.012	0.288	<0.001	<0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	4/25/02	7.6	776	13	150.13	511	90	500	81	33	16	4.8	9	151	165	0.005	0.276	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
06/01/149B	5/21/02	7.6	776	13	150.13	511	90	500	81	33	16	4.9	9	151	165	0.005	0.255	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
06/01/149B	6/20/02	7.3	780	15	150.39	510	86	35	21	7.4	10	148	157	0.007	0.281	<0.001	0.011	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	8/20/02	7.6	810	15	150.39	537	98	36	15	4.4	9	144	163	0.007	0.277	<0.001	0.012	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	9/12/02	7.5	784	13	150.75	485	72	35	21	6.7	8	142	158	0.006	0.276	<0.001	0.011	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	10/23/02	7.5	784	13	150.75	495	95	35	18	4.9	11	156	160	0.006	0.271	<0.001	0.011	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	11/25/02	7.6	661	12	150.08	499	95	35	18	4.9	11	156	158	0.006	0.266	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	12/16/02	7.6	704	11	150.92	519	96	36	18	5.6	11	152	158	0.006	0.276	<0.001	0.011	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	1/6/03	7.7	758	13	151.43	590	92	34	19	5.3	11	144	162	0.006	0.271	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	2/18/03	7.7	755	12	150.82	492	99	37	19	5.9	14	151	164	0.006	0.273	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	3/26/03	7.6	624	12	150.76	460	92	34	16	4.5	12	151	162	0.006	0.265	<0.001	0.014	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	6/1/03	7.5	773	14	150.46	500	90	31	14	4.4	9	144	161	0.016	0.28	<0.001	0.013	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	11/26/03	7.5	747	12	150.5	499	92	34	18	4.8	10	152	162	0.006	0.266	<0.001	0.011	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	11/26/03	7.5	730	12	151.18	530	89	33	16	4.8	5	148	162	0.006	0.277	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	3/19/04	7.2	747	15	151	520	89	33	16	4.6	8	150	160	0.006	0.270	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	6/20/04	7.4	785	15	151.45	480	81	30	15	4.5	9	150	165	0.009	0.309	<0.001	0.012	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	8/17/04	7.4	731	15	151.22	509	97	32	15	4.6	8	148	166	0.006	0.31	<0.001	0.011	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	11/24/04	7.6	774	12	151.09	480	74	32	17	5.3	9	149	150	0.006	0.282	<0.001	0.014	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
06/01/149B	12/26/04	7.5	721	12	151.09	1260	98	32	16	4.9	11	156	158	0.005	0.215	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
3/15/02	3/26/04	7.6	723	12	151.09	923	142	45	27	3	23	341	150	0.005	0.208	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	6/20/02	7.3	1320	14	123.89	835	145	55	31	3.5	21	337	151	0.005	0.205	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	8/20/02	7.4	1289	13	123.5	837	146	50	30	3.5	23	316	148	0.005	0.207	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	9/1/02	7.4	1289	12	123.56	818	146	53	41	5.4	20	334	148	0.005	0.205	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	11/25/02	7.4	1367	11	123.81	725	165	54	45	25	33	335	154	0.005	0.202	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	12/16/02	7.5	1210	11	123.48	1091	164	55	34	4.3	24	338	148	0.005	0.205	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	1/16/03	7.5	1297	12	123.32	1010	164	53	35	4.1	24	325	155	0.005	0.205	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	2/18/03	7.5	1287	12	123.92	774	147	47	29	3.8	29	341	152	0.005	0.201	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	3/26/03	7.4	1065	12	123.98	770	164	53	31	2.9	24	335	152	0.005	0.209	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
5/21/02	4/24/02	7.4	124.13	810	164	48	27	32	22	335	152	0.013	0.203	<0.001	0.034	<0.001	0.034	<0.001	0.028	<0.001	0.028	<0.001	0.028	<0.001	0.028	<0.001	0.028	<0.001			
5/21/02	5/19/02	7.4	124.48	800	163	52	31	3.4	24	335	148	0.005	0.205	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
5/21/02	6/19/02	7.4	124.8	870	158	51	33	3.5	24	338	150	0.005	0.207	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
5/21/02	7/19/02	7.4	124.8	879	158	51	31	3.3	23	342	0.2	155	0.005	0.207	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
5/21/02	8/17/02	7.4	125.31	770	147	47	29	3.2	26	338	0.2	153	0.006	0.232	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
5/21/02	9/17/02	7.4	125.54	860	176	50	28	3.2	26	339	0.2	154	0.005	0.213	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
5/21/02	10/17/02	7.4	125.84	817/04	71	54	33	4	20	337	0.2	154	0.006	0.234	<0.001	0.01	<0.02	<0.3	<0.05	<0.01	<0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
5/21/02	11/17/02	7.4	125.88	760	171	54	33	4	20	337	0.2	154	0.005	0.213	<0.0																

## **APPENDIX B**

### **Water Level Monitoring Data, 2002-2004**

**Table B-1 Water Elevation Data 2002-2004**

Measurements are reported in feet above mean sea level

Well	April 2002	Sept 02	April 2003	Sept 2003	April 2004	Sept 2004
ABC01	5248.62	5247.94	5247.67	5246.12	5245.22	5244.5
ABC02	BLOCKED	BLOCKED	BLOCKED	BLOCKED	BLOCKED	BLOCKED
ABC03	NM	4520.47	4519.87	4519.23	4518.16	4517.67
ABC04	BLOCKED	5161.1	5146.69	BLOCKED	BLOCKED	5144.95
ABC04A	5154.09	5153.32	5153.68	BLOCKED	BLOCKED	BLOCKED
ABC05	4709.72	4709.27	NM	4702.51	4694.36	4687.92
ABC06	5014.39	5031.25	5041.58	5045.02	5035.31	5010.05
ABC07	5251.51	5250.62	5250.12	5248.79	5247.95	5247.21
ABC08	NM	4598.63	4590.58	4597.64	4590.38	4595.73
B1G1120A	4815.2	4815.5	4811.64	4809.02	4806.25	4805.52
B1G1120B	NM	4815.05	NM	4810.32	NM	4806.6
B1G1120C	NM	4815.85	NM	4810.83	NM	4807.25
B1G951	5177.16	5176.59	5176.07	5175.75	5176.23	5174.98
B2G1157A	4595.75	4588.46	4589.2	4581.33	4587.25	4582.16
B2G1157B	NM	4585.75	NM	4579.43	NM	4579.96
B2G1157C	NM	4583.45	NM	4578.62	NM	4577.67
B2G1176A	4707.4	4709.02	4704.75	4701.96	4694.05	4688.11
B2G1176B	NM	4708.69	NM	4702.55	NM	4688.61
B2G1176C	NM	4708.79	NM	4702.96	NM	4689.05
B2G1193	NM	NM	NM	NM	NM	4569.09
B2G1194A	4599.98	4590.79	4593.7	NM	4591.05	4583.64
B2G1194B	NM	4590.71	NM	NM	NM	4583.58
B3G1197A	4605.11	4594.48	4599.66	NM	4595.29	4589.76
B3G1197B	NM	4593.98	NM	NM	NM	4591.46
B3G1197C	NM	4593.93	NM	NM	NM	4592.13
BCG1149A	NM	NM	NM	NM	NM	5238.72
BCG1149B	NM	NM	NM	NM	NM	5213.32
BCG1149C	NM	NM	NM	NM	NM	5212.49
BCG1150A	5215.14	NM	5214.63	5214.31	5213.66	5213.86
BCG1150B	NM	NM	NM	5213.54	NM	5213.11
BCG1150C	NM	NM	NM	5039.13	NM	5043.71
BCG1158A	5238.93	NM	5238.7	5238.13	5237.23	5236.83
BCG1158B	NM	NM	NM	5229.97	NM	5229.67
BCG1158C	NM	NM	NM	5222.71	NM	5222.26
BFG1136A	4706.21	4705.58	4703.85	4700.35	DRY	DRY
BFG1136B	NM	4705.41	NM	4700.43	4692.68	4686.48
BFG1136C	NM	4705.78	NM	4700.65	NM	4686.72
BFG1155B	4595.65	4584.87	4588.84	4579.31	4586.89	4579.02
BFG1155C	NM	4583.84	NM	4578.26	NM	4578.01
BFG1155D	NM	4582.83	NM	4577.9	NM	4577.65
BFG1155E	NM	4583.13	NM	4578.75	NM	4578.23
BFG1155F	NM	4583.09	NM	4578.8	NM	4578.41
BFG1156A	4590.98	DRY	DRY	DRY	DRY	DRY
BFG1156B	NM	4588.38	NM	4581.97	4588.38	4581.61
BFG1156C	NM	4589.04	NM	4583.05	NM	4582.8
BFG1156D	NM	4588.15	NM	4582.63	NM	4582.31
BFG1156E	NM	4591.18	NM	4583.48	NM	4583.57
BFG1156F	NM	4588.2	NM	4583.14	NM	4582.12
BFG1168A	4708.4	4708.65	4706.44	4702.81	4695.09	4688.86
BFG1168B	NM	4707.98	NM	4703.16	NM	4689.2
BFG1168C	NM	4708.19	NM	4703.22	NM	4689.33
BFG1195A	4596.6	4587.45	4589.97	4581.35	4588.13	4581.37
BFG1195B	NM	4587.32	NM	4581.59	NM	4581.54
BFG1198A	4708.1	4707.65	4706.08	4702.33	NM	4688.36

Well	April 2002	Sept 02	April 2003	Sept 2003	April 2004	Sept 2004
BFG1198B	NM	4707.62	NM	4702.51	NM	4688.59
BFG1198C	NM	4707.59	NM	4702.64	NM	4688.78
BFG1200	NM	NM	NM	NM	4548.55	NM
BSG1201	NM	NM	NM	NM	4675.02	NM
BRG286	5574.29	5573.29	NM	5569.4	5568.59	5569.37
BRG287	5348.26	5347.06	NM	5340.96	5339.96	5281.55
BRG288	5348.69	5347.66	5345.96	5344.95	5344.1	5344.25
BRG289	5348.41	5347.34	5345.62	5344.62	5343.85	5343.95
BRG290	5318.65	5317.75	5314.51	5313.12	5311.35	5310.62
BRG291A	5530.73	5529.93	5527.34	5525.41	5526.98	5527.72
BRG919	5601.46	5600.64	5599.41	5598.44	5600.17	5601.05
BRG920	5535.54	5534.64	5530.2	5528.3	5536.44	5534.55
BRG921	5330.07	5326.9	5324.81	5322.75	5320.58	5317.59
BRG999	5328.68	5326.86	5323.74	5321.67	5319.45	5318.2
BSG1119A	4626.4	4623.45	4620.15	4615.97	4615.01	4611.38
BSG1119B	NM	4625.29	NM	4616.71	NM	4613.26
BSG1119C	NM	4719.31	NM	4715.71	NM	4707.68
BSG1125A	4714.25	4714.88	4712.5	4707.97	4698.72	4691.75
BSG1125B	NM	4714.13	NM	4707.4	NM	4691.53
BSG1125C	NM	4713.2	NM	4705.94	NM	4690.46
BSG1130A	4612.27	4608.41	4605.08	4601.84	4601.71	4599.52
BSG1130B	NM	4604.41	NM	4598.19	NM	4595.82
BSG1130C	NM	4601.33	NM	4595.8	NM	4593.77
BSG1132A	4604.47	4597.86	4598.96	4591.72	4595.37	4590.07
BSG1132B	NM	4596.57	NM	4590.61	NM	4589.02
BSG1132C	NM	4591.91	NM	4586.61	NM	4584.79
BSG1133A	4610.6	4607.09	4609.55	4599.54	4600.58	4597.14
BSG1133B	NM	4607.05	NM	4600.33	NM	4597.79
BSG1133C	NM	4591.63	NM	4586.27	NM	4584.17
BSG1135A	4614.08	4611.47	4607.17	4604.89	4603.14	4601.74
BSG1135B	NM	4607.65	NM	4601.33	NM	4598.72
BSG1135C	NM	4599.88	NM	4594.35	NM	4592.41
BSG1137A	4605.93	4599.63	4599.61	4592.97	4595.84	4591.36
BSG1137B	NM	4596.56	NM	4591.18	NM	4589.45
BSG1137C	NM	4595.52	NM	4590.42	NM	4588.57
BSG1148A	4712.72	4713.99	NM	4706.23	4697.5	4690.89
BSG1148B	NM	4712.76	NM	4704.56	NM	4689.77
BSG1148C	NM	4712.57	NM	4704.74	NM	4689.67
BSG1153A	4770.99	4770.66	4767.71	4765.97	4762.25	4761.42
BSG1153B	NM	4733.98	NM	4727.42	NM	4741.41
BSG1153C	NM	4784.94	NM	4776.8	NM	4777.65
BSG1177A	4709.12	4711.98	4706.71	4697.83	4689.39	4683.42
BSG1177B	NM	4712.34	NM	4698.8	NM	4684.22
BSG1177C	NM	4713.48	NM	4706.25	NM	4691.98
BSG1179A	4710	4714.49	NM	4704.21	4695.72	4689.07
BSG1179B	NM	4714.34	NM	4702.99	NM	4688.24
BSG1179C	NM	4712.22	NM	4704.36	NM	4689.54
BSG1180A	4708.59	4709.1	4706.79	4700.56	4692.07	4685.83
BSG1180B	NM	4712.29	NM	4701.99	NM	4687.06
BSG1180C	NM	4711.44	NM	4704.1	NM	4689.84
BSG1196A	4708.32	4708.93	4706.4	4700.31	4691.96	DRY
BSG1196B	NM	4710.24	NM	4700.79	NM	4686.33
BSG1196C	NM	4701.41	NM	4702.9	NM	4688.05
COG1151A	5222.5	NM	NM	NM	5220.71	5220.41
COG1151B	NM	NM	NM	NM	NM	5231.9
COG1151C	NM	NM	NM	NM	NM	5213.55
COG1151D	NM	NM	NM	NM	NM	5211.2
COG1152A	5177.73	NM	NM	NM	5175.41	5175.79

Well	April 2002	Sept 02	April 2003	Sept 2003	April 2004	Sept 2004
COG1152B	NM	NM	NM	NM	NM	5205.52
COG1152C	NM	NM	NM	NM	NM	5174.59
COG1175A	4829.96	4829.11	4825.11	4822.43	4819.32	4817.27
COG1175B	NM	4829.73	NM	4823.08	NM	4817.93
COG1175C	NM	4829.5	NM	4823.84	NM	4818.93
COG1178A	4832.71	4830.91	4827.54	4824.86	4821.7	4819.89
COG1178B	NM	4830.92	NM	4824.92	NM	4819.63
COG1178C	NM	4830.96	NM	4825.06	NM	4819.76
COG918	NM	NM	NM	NM	NM	5219.07
ECG1112A	NM	NM	NM	NM	NM	5239.4
ECG1112B	NM	NM	NM	NM	NM	5252.61
ECG1113A	5174.57	5173.3	5172.39	5171.84	5171.03	5170.26
ECG1113B	NM	5141.91	NM	5143.65	NM	5139.66
ECG1113C	NM	5142.88	NM	5144.92	NM	5140.68
ECG1114A	5330.34	5324.96	5328.5	5327.31	5325.77	5324.94
ECG1114B	NM	4980.05	NM	4979.55	NM	4978.81
ECG1115A	4962.95	4958.67	4946.96	4945.42	4937.51	4927.49
ECG1115B	NM	4958.06	NM	4948.99	NM	4930.81
ECG1115C	NM	4952.36	NM	4948.7	NM	4931.24
ECG1115D	NM	4967.12	NM	4958.33	NM	4939.96
ECG1115E	NM	4933.18	NM	4932.44	NM	4931.73
ECG1116A	4951.65	4945.95	4938.31	4937.55	DRY	DRY
ECG1116B	NM	4947.57	NM	4940.94	4936.01	4929.84
ECG1116C	NM	5114.35	NM	5117.15	NM	5114.8
ECG1117A	4961.95	4956.61	4945.98	4943.76	4936.03	4926.05
ECG1117B	NM	4961.56	NM	4952.91	NM	4935.08
ECG1117C	NM	4968.01	NM	4958.96	NM	4941.35
ECG1118A	4808.61	4808.28	4804.76	4803.79	4798.54	4774.04
ECG1118B	NM	4810.25	NM	4805.18	NM	4777.85
ECG1118C	NM	4812.49	NM	4807.55	NM	4781.03
ECG1121A	4812.47	4813.62	4808.36	4806.48	4803.27	4800.29
ECG1121B	NM	4811.81	NM	4807.01	NM	4801.4
ECG1121C	NM	4812.17	NM	4807.16	NM	4801.52
ECG1124A	4951.8	4954.3	4938.69	4937.78	4929.35	4917.36
ECG1124B	NM	4949.63	NM	4935.66	NM	4912.98
ECG1124C	NM	4964.63	NM	4955.68	NM	4937.23
ECG1128A	4951.68	4945.77	4936.06	4934.65	4926.24	4915.13
ECG1128B	NM	4939.18	NM	4932.08	NM	4916.66
ECG1128C	NM	4950.31	NM	4940.6	NM	4920.71
ECG1131A	4910.13	4908.24	4905.21	4903.83	4900.22	4897.72
ECG1131B	NM	4918.58	NM	4913.07	NM	4882.39
ECG1131C	NM	4926.81	NM	4920.14	NM	4905.79
ECG1142A	4962.26	4953.4	4944.45	4943.49	4933.69	4923.63
ECG1142B	NM	4973.42	NM	4967.92	NM	4961.3
ECG1142C	NM	4965.85	NM	4963.76	NM	4961.73
ECG1143A	5050.37	5050.07	5051.49	5052.95	5053.13	5049.58
ECG1143B	NM	5038.93	NM	5050.78	NM	5025.48
ECG1143C	NM	5067.69	NM	5076.99	NM	5048.94
ECG1144A	4852.6	4854.57	4847.78	4845.8	4843.91	4842.48
ECG1144B	NM	4952.46	NM	4942.32	NM	4922.41
ECG1144C	NM	4955.61	NM	4946.67	NM	4928.33
ECG1145A	4953.17	4946	4935.64	4934.72	4925.62	4915.23
ECG1145B	NM	4942.83	NM	4937.76	NM	4916.54
ECG1145C	NM	4940.23	NM	4940.27	NM	4920.11
ECG1146	4945.99	4929.92	4921.8	4921.28	4908.4	4898.52
ECG1182A	5569.33	5570.89	5571.77	5571.76	5567.55	5567.23
ECG1182B	NM	5575.16	NM	5574.82	NM	5574.33
ECG1183A	5419.22	5417.99	5418.56	5417.16	5421.02	5419.11

Well	April 2002	Sept 02	April 2003	Sept 2003	April 2004	Sept 2004
ECG1183B	NM	5428.58	NM	5427.85	NM	5429.15
ECG1184	5411.23	5405.2	5414.45	5404.15	5413.79	5404.19
ECG1186	5330.31	5329.24	5327.98	5326.78	5325.3	5324.71
ECG1187	5333.59	5332.56	5331.08	5329.99	5328.45	5327.66
ECG1188	5329.03	5327.75	5326.77	5319.59	5324.16	5323.53
ECG1189	NM	5156.86	NM	5156.72	5156.37	5156.65
ECG1190	5282.09	5281.25	5280.45	5279.65	5278.66	5278.19
ECG1199A	5330.3	5329.34	5328.03	5326.88	5325.43	5324.73
ECG1199B	NM	5315.41	NM	5314.24	NM	5314.19
ECG1199C	NM	5329.3	NM	5326.74	NM	5324.58
ECG1199D	NM	5329.3	NM	5327.06	NM	5324.62
ECG1199E	NM	5329.32	NM	5326.81	NM	5324.68
ECG1199F	NM	5329.44	NM	5326.97	NM	5324.84
ECG1199G	NM	5328.97	NM	5326.48	NM	5324.32
ECG293	5260.64	5260.47	5259.57	5258.21	5257.63	5256.85
ECG294	5280.77	5279.8	5278.13	5276.6	5275.18	5275.64
ECG295B	NM	5268.24	5266.79	5265.57	5264.69	5265.09
ECG296	5294.23	5293.74	5292.44	BLOCKED	5290.55	BLOCKED
ECG297	5305.53	5306.94	5302.47	5301.53	5300.62	5300.35
ECG299	5326.62	5324.77	5321.82	5319.88	5317.58	5316.43
ECG900	5327.44	5325.45	5322.61	5320.61	5318.38	5317.1
ECG901	5327.24	5325.31	5322.43	5320.39	5318.1	5316.91
ECG902	BLOCKED	BLOCKED	BLOCKED	BLOCKED	BLOCKED	5339.71
ECG903	5480.61	5477.85	5472.96	5470.06	5466.37	5465.51
ECG904	5352.92	5351.37	5348.2	5346.9	5349.54	5347.4
ECG905	5374.93	5373.4	5374.7	5367.76	5368.35	5368.9
ECG906	5331.33	5330.4	5328.82	5327.59	5325.94	5325.35
ECG907	5331.62	5330.66	5328.81	5327.6	5325.97	5325.16
ECG908	5578.15	5567.96	5576.98	5574.58	5577.96	NM
ECG909	5475.79	NM	5473.78	5473.04	5475.24	5476.53
ECG915	FLOWING	FLOWING	FLOWING	FLOWING	FLOWING	FLOWING
ECG916	5563.82	5561.08	5564.17	5562.08	5563.58	LID DAMAGE
ECG917	5350.68	5349.22	5346.82	5345.29	5342.9	5341.85
ECG920	NM	NM	NM	NM	NM	NM
ECG921	NM	NM	NM	NM	NM	NM
ECG922	5331.68	5330.72	5328.94	5328.08	5326.12	5325.36
ECG923	5420.37	5417.83	5413.84	5411.25	5408.05	5408.2
ECG924	5556.91	5556.57	5555.9	5555.82	5557.69	5556.77
ECG925	5520.83	5518	5520.45	5517.19	5521.7	5518.77
ECG926	5510.84	5508.48	5509.5	5507.61	5512.58	5508.5
ECG928	5419.98	5417.58	5413.17	5411.1	5407.85	5408.11
ECG931	5569.68	5568.92	5569.16	5568.48	5573.06	5569.62
ECG932	5631.61	5631.18	5630.45	5628.68	5630.36	NM
ECG933	NM	5572.69	5572.99	5572.15	5573.51	5571.79
ECG934	5579.02	5577.84	5577.88	5576.57	5578.89	5576.52
ECG935	5707.94	5707.58	NM	5707.58	5708.85	5707.84
ECG936	5841.1	5840.84	5840.33	NM	NM	5841.88
ECG937	5806.7	5804.44	5802.93	5802	5802.1	5801.37
ECG938	5983.64	5982.74	5984.42	5982.51	5983.42	5982.31
ECG939	5984.55	5982.07	5984.31	5982.22	5983.29	LID DAMAGE
ECG940	6079.63	6074.43	6081.07	6075.73	6080	6076.25
ECG952	5142.93	NM	5142.54	5142.25	5142.08	5131.29
EPG1165A	4609.6	4605.08	4602.68	4598.88	4599.21	4596.56
EPG1165B	NM	4602.98	NM	4597.03	NM	4595.02
EPG1165C	NM	4599.36	NM	4594.17	NM	4592.28
EPG1166	4589.42	4566.37	4583.61	4561.65	4584.42	4563.35
EPG1689	4604.41	NM	NM	NM	NM	NM
HMG1122A	4717.4	4717.77	4715.53	4710.95	4702.72	4696.63

Well	April 2002	Sept 02	April 2003	Sept 2003	April 2004	Sept 2004
HMG1122B	NM	4716.38	NM	4709.26	NM	4694.88
HMG1122C	NM	4753.46	NM	4750.62	NM	4743.39
HMG1123A	4715.19	4715.96	4713.46	4708.5	4699.77	4692.73
HMG1123B	NM	4715.37	NM	4707.85	NM	4692.78
HMG1123C	NM	4714.5	NM	4707.08	NM	4692.09
HMG1126A	4735.2	4733.71	4731.73	4723.74	4722.5	4716.91
HMG1126B	NM	4732.92	NM	4727.17	NM	4716.31
HMG1126C	NM	4728.98	NM	4722.12	NM	4709.22
HMG1134A	4612.4	4616.39	4612.23	4610.35	4607.47	4606.45
HMG1134B	NM	4608.29	NM	4602.09	NM	4599.75
HMG1134C	NM	4603.9	NM	4598.04	NM	4596.46
HMG1163A	4575.29	4588.06	4575.29	NM	4575.27	4587.94
HMG1163B	NM	4588.65	NM	NM	NM	4588.36
HMG1163C	NM	4492.61	NM	NM	NM	4491.28
HMG1163Z	4575.94	4587.27	NM	NM	NM	4586.92
HMG1164A	NM	NM	NM	4499.83	NM	ABANDONED
RVG1164Z	NM	NM	NM	4499.15	NM	ABANDONED
K105	5111.79	5113.95	5113.93	5113.19	5113.02	5115.75
K106	4708.55	4706.96	4703.73	4702.98	4695.32	4689.26
K120	5139.39	5140.94	5139.32	5138.91	5138.77	5146.52
K201	4616.34	4613.9	4609.7	NM	NM	4605.63
K26	4965.4	DRY	DRY	DRY	DRY	DRY
K70	5326.16	5325	5324.15	5322.75	5321.15	BLOCKED
K72	BLOCKED	BLOCKED	BLOCKED	5259.69	BLOCKED	BLOCKED
K84	5174.97	5174.98	5174.81	5174.29	NM	5172.67
LRG910	5244.43	5243.22	5242.07	5241.25	5241.36	5240.27
LRG911	5203.44	5203.32	5201.64	5201.2	5201.3	5201.12
LRG912	5223.75	5223.5	5222.68	5222.23	5221.54	5221.48
LRG914	5257.61	5256.64	5256.47	5254.8	5253.56	5252.78
LTG1127A	5175.11	5174.07	5172.72	5171.63	5170.32	5169.5
LTG1127B	NM	5180.76	NM	5178.32	NM	5176.28
LTG1127C	NM	5183.06	NM	5182.29	NM	5180.22
LTG1129A	5022.08	5024.37	5029.21	5031.65	5031.71	5025.95
LTG1129B	NM	5029.5	NM	5043.68	NM	5013
LTG1129C	NM	5033.17	NM	5047.18	NM	5010.72
LTG1138A	4719.5	4720.14	4716.82	4696.71	4685.77	DRY
LTG1138B	NM	4719.54	NM	4688.23	NM	4669.13
LTG1138C	NM	4719.57	NM	4693.63	NM	4675.67
LTG1138D	NM	4720.09	NM	4695.82	NM	4678.01
LTG1138E	NM	4720.06	NM	4696.6	NM	4678.86
LTG1138F	NM	4716.95	NM	4704	NM	4688.01
LTG1139	5013.91	5028.72	5039.22	5044.55	NM	5013.53
LTG1140A	5011.54	5029.79	5040.63	5044.17	5034.85	5014.97
LTG1140B	NM	5030.4	NM	5044.43	NM	5015.37
LTG1140C	NM	5032.99	NM	5046.64	NM	5016.54
LTG1140D	NM	5065.56	NM	5075.6	NM	5048.01
LTG1141A	NM	5026.71	5031.65	5034.23	5034.31	5028.2
LTG1141B	NM	5029.9	NM	5043.8	NM	5015.54
LTG1141C	NM	5032.31	NM	5046.19	NM	5016.24
LTG1147	4719.19	4720.87	4716.52	NM	NM	NM
LTG1167A	4903.62	4908.3	4903.6	4902.3	4900.64	4900.93
LTG1167B	NM	4909.09	NM	4904.39	NM	4903.09
LTG1167C	NM	4911.26	NM	4906.26	NM	4905.23
LTG1191	5308.5	5307.62	5307.78	5307.23	5308.65	5307.64
LTG929A	5209.6	5210.23	5209.01	5206.81	5208.37	5211.77
LTG929B	NM	5206.41	NM	5204.38	NM	5206.42
P190A	4607.71	4603.36	4600.25	4596.84	DRY	DRY
P190B	NM	4603.64	4601.02	4597.05	4598.61	4594.67

Well	April 2002	Sept 02	April 2003	Sept 2003	April 2004	Sept 2004
P191A	DRY	DRY	DRY	DRY	DRY	DRY
P191B	4600.63	4592.44	4594.74	4586.49	4592.12	4585.05
P192A	NM	NM	DRY	DRY	DRY	DRY
P192B	4605.96	4597.2	4599.62	4591.87	4596.28	4593.66
P193A	DRY	DRY	DRY	DRY	DRY	DRY
P193B	NM	4595.71	NM	4590.64	4595.72	4587.86
P194A	4608.86	4604.09	4601.95	4598.05	4598.63	4595.98
P194B	NM	4603.78	NM	4597.69	NM	4595.62
P197B	4587.82	4586.94	4590.08	4580.86	4588.04	4582.52
P208A	4950.33	4943.31	4936.36	4936.53	4928.76	4923.16
P208B	NM	4942.36	NM	4932.97	NM	4916
P209B	4710.11	4708.21	4706.1	4701.55	4693.58	4695.79
P211A	4895.23	4894.71	4893.07	4892.06	4890.78	4878.16
P211B	NM	4895.42	NM	4892.88	NM	4878.52
P212A	5039.57	NM	5039.45	5043.09	5034.36	5027
P212B	NM	NM	NM	5044.66	NM	5025.24
P214A	5420.23	5419.07	5416.07	5419.36	5422.06	5420.88
P220	5492.54	5489.7	5484.64	5481.65	5478.09	5476.72
P225	5455.63	5452.47	5447.94	5444.62	5440.57	5439.12
P228	5760.62	5760.25	5759.7	5758.67	5763.95	5760.91
P231	5306.05	5307.34	5307.37	5306.68	5307.91	5335.64
P239	5900.41	5828.91	NM	NM	NM	NM
P240B	4596.61	NM	NM	NM	4595.48	4592.58
P241A	NM	NM	NM	NM	NM	4726.82
P241B	4710.27	4713.38	4708.7	4702.5	4693.95	4688.9
P241C	4713.66	NM	4713.27	4710.18	4700.47	4690.73
P242	5182.88	NM	NM	5181.76	5180.59	5181.43
P243	NM	5335.54	5334.28	5333.47	5332.1	5334.88
P244A	5628.96	5629.16	5627.92	5627.76	5629.64	5639.45
P244B	NM	5624.3	NM	5623.53	NM	5637.44
P244C	NM	5620.55	NM	5619.38	NM	5635.01
P245	NM	5441.04	5439.59	5434.23	5439.67	5438.36
P247A	NM	4428.82	4421.1	4425.43	4418.26	4428.19
P248A	5252.29	5252.1	5255.36	5250.13	5250.06	5249.62
P248B	NM	5252.97	NM	5251.06	NM	5251.52
P248C	NM	5256.97	NM	5255.04	NM	5257.36
P249A	4835.64	4833.75	4828.14	NM	NM	NM
P249B	NM	4833.82	NM	4827.81	NM	NM
P252A	4418.23	NM	NM	NM	4415.6	4421.31
P252B	NM	NM	NM	NM	NM	4416.5
P252C	NM	NM	NM	NM	NM	4419.26
P253A	NM	4420.9	4412.96	4417.47	4410.79	4417.01
P253B	NM	4418.36	NM	4415.15	NM	4414.83
P254A	NM	4585.29	4576.9	4585.37	4576.52	4583.98
P254B	NM	4591.23	NM	4590.45	NM	4590.13
P255A	NM	4651.56	4627.71	4646.62	4626.26	4649.17
P255B	NM	4647.17	NM	4642.99	NM	4644.86
P256	NM	4593.39	4583.18	4597.67	4585	4596.64
P257	4624.32	4627.97	4620.29	4623.5	4617.7	4621.61
P259	NM	4420.25	4412.87	4413.8	4410.63	4416.26
P260	4597.69	4599.22	4596.64	4599.3	4597.15	4600.07
P261	4615.79	4609.85	4609.33	NM	NM	4616.96
P262	NM	4442.33	NM	4439.5	NM	4439.25
P263	4594.09	4594.39	4594.58	4594.78	4589.41	4597.12
P264	4809.71	4806.62	4802.76	4800.37	4797.23	4794.86
P267B	4788.02	4780.22	4782.74	4779.27	4784.05	4777.3
P268	4901.07	4903.39	4901.57	4900.08	4898.74	4898.22
P269	5038.39	NM	NM	5041.8	5037.08	DRY

Well	April 2002	Sept 02	April 2003	Sept 2003	April 2004	Sept 2004
P270	5384.74	5380.36	5391.81	5381.31	5386.64	5380.7
P271	5439.04	5438.47	5438.86	5438.05	5440.48	5438.66
P272	5529.22	5528.38	5526.25	5524.86	5526.56	5526.66
P273	4914.37	NM	NM	NM	4906.14	4904.35
P274	5082.85	NM	5082.36	5082.18	5081.99	5079.51
P277	4710.58	4710.12	4708.83	4703.81	4696.78	4691.26
P279	4955.66	4952.92	4939.48	4938.39	4930.37	4919.92
SRG945	5151.69	5151.61	5151.48	NM	5150.96	NM
SRG946	5171.2	5171.58	5168.76	NM	5165.58	NM
W131A	4640.37	4637.82	5151.48	4630.85	4630.24	4625.66
W32	NM	NM	NM	NM	NM	NM
W403	4808.16	4798.02	4805.78	4806.26	4807.61	4795.88
WJG1154A	4599.25	4584.11	4592.78	4584.4	4590.15	4577.53
WJG1154B	NM	4584.11	NM	4580.21	NM	4577.56
WJG1154C	NM	4584.54	NM	4584.4	NM	4577.12
WJG1169A	4709.32	4708.69	4707.61	4704.4	4696.63	4690.9
WJG1169B	NM	4708.65	NM	4704.5	NM	4691.03
WJG1169C	NM	4708.45	NM	4704.56	NM	4691.1
WJG1170A	4598.36	4585.55	4591.93	4580.4	4589.35	4578.68
WJG1170B	NM	4585.09	NM	4580.25	NM	4578.38
WJG1170C	NM	4584.81	NM	4580.11	NM	4578.28
WJG1171A	4601.88	4573.04	4595.93	4576.65	4592.79	4573.28
WJG1171B	NM	4569.86	NM	4576.36	NM	4572.47
WJG1171C	NM	4569.06	NM	4576.4	NM	4572.42
WJG1980	4596.52	4574.64	NM	4578.34	4592.94	4570.89
WJG1981	NM	NM	NM	NM	NM	NM
WJG2453	4596.5	NM	NM	NM	4592.38	NM

NM=Not Measured

## **APPENDIX C**

### **Tailings Monitoring Data, 2003-2004**

**Table C-1 Daily Tailings Monitoring Data 2003-2004**

	Tailings pH at North Splitter Box (su)	Acid Water Pumping through WDPS (gpm)	Concentrator Throughput (TPH)
1/1/2003	7.4	3532	4359
1/2/2003	7.0	3472	3827
1/3/2003	7.2	3091	4864
1/4/2003	7.3	2456	4422
1/5/2003	7.3	2469	5016
1/6/2003	7.3	2434	5247
1/7/2003	7.1	2462	4512
1/8/2003	7.1	2451	3996
1/9/2003	7.2	2436	5934
1/10/2003	7.4	2448	6118
1/11/2003	7.2	2539	6407
1/12/2003	7.9	1616	6036
1/13/2003	7.2	2701	6304
1/14/2003	7.5	3202	5521
1/15/2003	7.1	3381	5640
1/16/2003	7.6	2817	5892
1/17/2003	7.9	2060	6480
1/18/2003	7.8	2533	5380
1/19/2003	7.2	3353	5441
1/20/2003	7.2	3670	5480
1/21/2003	7.1	3470	5566
1/22/2003	7.0	3580	5108
1/23/2003	7.1	3942	5592
1/24/2003	7.3	3917	5719
1/25/2003	7.3	3440	5688
1/26/2003	7.1	3382	5709
1/27/2003	7.0	3469	5290
1/28/2003	7.1	3595	5458
1/29/2003	7.1	3768	4352
1/30/2003	7.1	3900	4656
1/31/2003	7.2	3452	5217
2/1/2003	7.3	3422	5428
2/2/2003	7.3	3506	4854
2/3/2003	7.9	3951	1427
2/4/2003	8.4	4996	1372
2/5/2003	7.1	3413	4569
2/6/2003	7.4	3473	4395
2/7/2003	7.4	3406	4865
2/8/2003	7.5	3418	4834
2/9/2003	7.6	3439	6188
2/10/2003	7.8	3441	5621
2/11/2003	7.8	3334	4953
2/12/2003	8.0	3128	4667
2/13/2003	7.7	2746	4121
2/14/2003	7.5	3317	5575
2/15/2003	7.5	3602	6522
2/16/2003	7.5	3778	7315
2/17/2003	7.1	3673	6835
2/18/2003	7.1	4155	6389
2/19/2003	7.3	4823	6644
2/20/2003	7.2	4986	7409
2/21/2003	7.2	4855	7506
2/22/2003	7.1	4285	7345
2/23/2003	7.3	4196	7517

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
2/24/2003	7.1	4320	6567
2/25/2003	7.2	4862	5962
2/26/2003	7.0	4253	4841
2/27/2003	7.4	3478	5722
2/28/2003	7.2	4159	6252
3/1/2003	7.3	3849	5295
3/2/2003	7.3	3474	5457
3/3/2003	7.5	3182	5193
3/4/2003	7.6	2665	4271
3/5/2003	7.6	2600	3444
3/6/2003	7.6	2525	4128
3/7/2003	7.6	2429	4935
3/8/2003	7.6	2427	5076
3/9/2003	7.7	2419	5511
3/10/2003	8.0	2514	5848
3/11/2003	8.2	2660	6524
3/12/2003	8.0	2721	6314
3/13/2003	8.0	3054	6783
3/14/2003	7.9	2945	6902
3/15/2003	7.3	2671	6427
3/16/2003	7.2	2389	5674
3/17/2003	6.8	2556	6787
3/18/2003	6.9	2870	5397
3/19/2003	6.9	2964	6758
3/20/2003	6.9	3248	7593
3/21/2003	7.3	3572	6891
3/22/2003	7.4	3734	6713
3/23/2003	7.6	3887	6528
3/24/2003	7.8	3692	6219
3/25/2003	8.5	3431	6160
3/26/2003	7.9	3670	5362
3/27/2003	7.6	3216	5429
3/28/2003	7.7	3013	5794
3/29/2003	7.7	3363	5915
3/30/2003	7.6	3556	5331
3/31/2003	7.4	3752	5903
4/1/2003	7.1	0	4199
4/2/2003	7.4	0	3842
4/3/2003	7.6	0	3879
4/4/2003	6.6	0	4800
4/5/2003	7.9	0	4824
4/6/2003	7.9	0	5740
4/7/2003	7.6	0	6092
4/8/2003	7.5	0	4646
4/9/2003	7.5	0	3580
4/10/2003	7.3	0	1774
4/11/2003	7.7	0	3171
4/12/2003	7.8	0	4220
4/13/2003	7.9	0	4391
4/14/2003	7.8	0	5355
4/15/2003	7.9	0	6284
4/16/2003	7.8	0	5865
4/17/2003	7.9	0	6967
4/18/2003	7.9	0	6750
4/19/2003	7.8	0	6724
4/20/2003	7.7	0	7155
4/21/2003	8.1	0	1960

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
4/22/2003	7.8	0	6985
4/23/2003	7.8	1655	6631
4/24/2003	7.8	4452	6825
4/25/2003	7.9	4241	7207
4/26/2003	7.9	4305	7751
4/27/2003	8.0	4319	7767
4/28/2003	8.2	3916	7627
4/29/2003	8.2	3874	6896
4/30/2003	7.9	4359	6475
5/1/2003	7.8	4473	6666
5/2/2003	7.9	4365	6743
5/3/2003	7.6	4178	6008
5/4/2003	7.8	4346	6192
5/5/2003	7.9	3828	5885
5/6/2003	8.7	1995	5751
5/7/2003	9.8	0	3784
5/8/2003	9.7	114	4181
5/9/2003	9.7	0	3977
5/10/2003	9.7	0	4820
5/11/2003	9.7	0	5133
5/12/2003	9.7	0	4770
5/13/2003	9.8	0	4675
5/14/2003	9.8	0	5070
5/15/2003	9.8	0	4844
5/16/2003	9.8	0	5202
5/17/2003	9.6	0	6742
5/18/2003	9.6	0	6498
5/19/2003	9.5	0	6918
5/20/2003	9.3	0	5582
5/21/2003	9.6	187	5135
5/22/2003	8.6	1842	5309
5/23/2003	7.7	3065	5344
5/24/2003	7.7	3076	6340
5/25/2003	7.7	3166	5956
5/26/2003	7.6	3317	5960
5/27/2003	7.5	3184	5771
5/28/2003	7.7	3036	6966
5/29/2003	7.8	3074	6270
5/30/2003	7.6	3012	6751
5/31/2003	7.5	3167	6901
6/1/2003	7.5	3154	7115
6/2/2003	7.7	3122	5834
6/3/2003	7.8	3149	5301
6/4/2003	7.6	3121	4641
6/5/2003	7.8	3217	5496
6/6/2003	8.0	3034	6895
6/7/2003	7.6	3198	5383
6/8/2003	7.5	3192	5074
6/9/2003	7.5	3125	5285
6/10/2003	7.5	2981	4192
6/11/2003	7.6	3086	5005
6/12/2003	7.8	3028	5748
6/13/2003	7.8	3123	6295
6/14/2003	7.9	3275	6328
6/15/2003	7.6	3029	5956
6/16/2003	7.7	2975	6181
6/17/2003	7.9	2860	6691

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
6/18/2003	7.8	3016	6356
6/19/2003	7.9	2933	5627
6/20/2003	8.0	2976	6178
6/21/2003	8.2	2811	5931
6/22/2003	8.3	2707	5879
6/23/2003	8.2	2785	5765
6/24/2003	8.2	2710	5997
6/25/2003	8.2	2903	6800
6/26/2003	8.3	2795	5864
6/27/2003	8.2	2774	5908
6/28/2003	8.4	2627	6557
6/29/2003	8.5	2144	5929
6/30/2003	8.4	2713	5878
7/1/2003	8.3	2988	4802
7/2/2003	8.5	2740	4891
7/3/2003	8.0	1367	2604
7/4/2003	8.3	2213	5246
7/5/2003	8.3	3012	7064
7/6/2003	8.2	2975	6884
7/7/2003	8.3	2901	6997
7/8/2003	7.8	2940	6744
7/9/2003	7.8	3107	6179
7/10/2003	8.1	2966	6242
7/11/2003	7.9	3090	6075
7/12/2003	7.9	2972	6938
7/13/2003	7.9	2832	7137
7/14/2003	8.0	2658	7285
7/15/2003	8.0	2324	6496
7/16/2003	7.3	2159	5556
7/17/2003	8.1	2210	6137
7/18/2003	8.0	2220	7322
7/19/2003	8.2	2199	7884
7/20/2003	8.1	2199	7658
7/21/2003	8.3	2217	7733
7/22/2003	8.3	2232	6756
7/23/2003	8.0	2276	5639
7/24/2003	7.9	2300	7305
7/25/2003	8.2	2349	6629
7/26/2003	8.3	2276	5872
7/27/2003	9.4	55	548
7/28/2003	8.5	1672	6642
7/29/2003	8.1	2293	6503
7/30/2003	7.9	2223	6303
7/31/2003	7.8	2422	6626
8/1/2003	7.7	2599	6626
8/2/2003	7.8	2648	6331
8/3/2003	8.0	2631	5654
8/4/2003	7.4	2494	5640
8/5/2003	7.9	2213	5575
8/6/2003	8.1	2830	5467
8/7/2003	8.0	3241	5691
8/8/2003	8.0	3329	6565
8/9/2003	8.3	3330	7178
8/10/2003	8.3	3334	6733
8/11/2003	8.1	3362	6342
8/12/2003	8.1	3363	5705
8/13/2003	8.2	3341	6689

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
8/14/2003	8.5	3344	6329
8/15/2003	8.2	3320	5998
8/16/2003	7.8	3283	5978
8/17/2003	8.0	3041	6161
8/18/2003	8.0	3116	6343
8/19/2003	8.0	3254	6310
8/20/2003	8.7	1417	4893
8/21/2003	8.6	1093	5008
8/22/2003	8.6	206	2038
8/23/2003	8.1	0	11
8/24/2003	8.7	0	9
8/25/2003	8.5	1691	4966
8/26/2003	8.1	2858	6858
8/27/2003	8.3	2111	5206
8/28/2003	8.3	2973	6307
8/29/2003	8.4	3146	5992
8/30/2003	8.1	3234	6553
8/31/2003	8.2	2804	6684
9/1/2003	8.2	3303	6649
9/2/2003	8.9	1350	5905
9/3/2003	9.4	0	5041
9/4/2003	9.6	0	6764
9/5/2003	9.1	1301	6793
9/6/2003	8.2	3364	6770
9/7/2003	8.2	3332	6775
9/8/2003	8.4	3347	6447
9/9/2003	9.0	1068	6223
9/10/2003	9.4	0	6985
9/11/2003	8.9	1981	6751
9/12/2003	8.4	3316	7093
9/13/2003	8.4	3251	6999
9/14/2003	8.2	3245	4804
9/15/2003	8.4	3297	6932
9/16/2003	8.6	2460	5570
9/17/2003	8.3	3085	6173
9/18/2003	8.7	1861	6325
9/19/2003	8.8	2009	6057
9/20/2003	8.5	3022	5176
9/21/2003	8.4	3362	4948
9/22/2003	8.1	3206	4324
9/23/2003	8.0	3114	4840
9/24/2003	8.2	3052	4812
9/25/2003	8.2	3324	4867
9/26/2003	8.5	3258	6547
9/27/2003	8.7	3274	6593
9/28/2003	8.6	3284	6712
9/29/2003	8.6	3221	5446
9/30/2003	8.5	2814	6601
10/1/2003	8.7	2,447	5,636
10/2/2003	8.4	3,277	5,366
10/3/2003	8.6	3,173	6,114
10/4/2003	8.7	3,011	7,182
10/5/2003	8.7	2,928	7,529
10/6/2003	8.6	3,069	7,384
10/7/2003	8.4	3,371	6,213
10/8/2003	8.0	3,381	6,092
10/9/2003	7.9	3,388	6,194

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
10/10/2003	8.2	3,293	6,968
10/11/2003	8.4	3,356	6,946
10/12/2003	8.6	3,305	6,398
10/13/2003	8.6	3,091	6,607
10/14/2003	8.3	3,347	4,982
10/15/2003	8.2	3,345	4,380
10/16/2003	8.3	3,310	4,361
10/17/2003	7.9	3,662	4,294
10/18/2003	8.2	2,956	4,272
10/19/2003	8.6	2,528	6,092
10/20/2003	8.0	4,157	6,316
10/21/2003	7.7	4,651	7,078
10/22/2003	7.5	5,006	7,607
10/23/2003	7.6	4,722	7,240
10/24/2003	7.5	5,175	7,104
10/25/2003	7.4	5,257	5,823
10/26/2003	7.6	5,052	5,665
10/27/2003	7.5	5,319	5,769
10/28/2003	7.5	5,548	5,653
10/29/2003	7.2	5,705	4,782
10/30/2003	7.4	5,706	5,945
10/31/2003	7.4	5,706	6,683
11/1/2003	7.0	4,921	6,246
11/2/2003	6.3	1,056	5,695
11/3/2003	6.7	5,359	5,218
11/4/2003	7.0	5,228	4,643
11/5/2003	7.0	5,572	5,463
11/6/2003	7.0	5,244	4,967
11/7/2003	7.1	5,448	5,643
11/8/2003	7.2	5,646	6,290
11/9/2003	7.1	5,620	7,277
11/10/2003	7.5	5,624	7,818
11/11/2003	7.5	5,656	7,060
11/12/2003	7.1	5,542	5,448
11/13/2003	7.7	3,879	6,959
11/14/2003	7.9	4,197	6,860
11/15/2003	7.3	5,506	7,285
11/16/2003	6.3	5,548	6,793
11/17/2003	7.6	5,542	7,328
11/18/2003	7.6	5,435	5,338
11/19/2003	7.6	5,084	4,457
11/20/2003	7.5	5,016	5,465
11/21/2003	7.8	4,695	5,627
11/22/2003	8.1	4,824	6,846
11/23/2003	8.1	4,822	6,895
11/24/2003	8.1	4,865	6,004
11/25/2003	7.9	4,810	5,678
11/26/2003	7.7	4,921	5,521
11/27/2003	7.7	4,935	6,709
11/28/2003	7.8	4,895	6,771
11/29/2003	7.9	4,882	6,286
11/30/2003	7.8	4,896	5,696
12/1/2003	7.9	4,855	5,867
12/2/2003	8.2	3,939	5,365
12/3/2003	8.0	3,478	4,474
12/4/2003	7.9	4,238	5,536
12/5/2003	7.8	4,514	5,426

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
12/6/2003	7.8	4,515	6,410
12/7/2003	7.8	4,544	5,815
12/8/2003	7.8	4,637	4,978
12/9/2003	7.6	4,513	5,008
12/10/2003	7.6	4,714	5,192
12/11/2003	7.6	5,133	5,117
12/12/2003	7.4	5,301	5,245
12/13/2003	7.5	5,225	6,627
12/14/2003	7.8	5,389	6,834
12/15/2003	7.8	5,511	5,896
12/16/2003	7.6	5,619	6,017
12/17/2003	7.6	5,547	6,437
12/18/2003	7.4	5,828	6,177
12/19/2003	7.3	5,675	6,381
12/20/2003	7.4	5,767	7,088
12/21/2003	7.6	5,862	6,701
12/22/2003	7.7	5,759	6,138
12/23/2003	7.7	5,704	6,315
12/24/2003	7.7	5,735	5,890
12/25/2003	7.6	5,846	6,135
12/26/2003	6.7	3,207	2,253
12/27/2003	8.0	2,323	5,431
12/28/2003	7.5	4,455	4,675
12/29/2003		2,639	5,776
12/30/2003		3,212	6,401
12/31/2003	8.4	3,387	6,304
1/1/2004	7.6	5490.09	5990.97
1/2/2004	7.7	5567.02	5570.28
1/3/2004	7.8	5539.90	5732.52
1/4/2004	7.8	5485.81	5512.47
1/5/2004	7.7	5663.44	5293.23
1/6/2004	8.8	1932.18	2302.36
1/7/2004	7.8	5810.77	5135.72
1/8/2004	7.7	6073.61	5521.11
1/9/2004	7.7	6014.69	5835.35
1/10/2004	7.7	6057.11	5927.31
1/11/2004	7.9	6053.14	5753.67
1/12/2004	7.8	6044.70	4992.67
1/13/2004	7.8	6010.50	5534.61
1/14/2004	8.6	2823.59	2712.64
1/15/2004	8.9	0.00	32.97
1/16/2004	8.3	4673.24	4520.66
1/17/2004	7.9	6080.31	5384.09
1/18/2004	8.0	5867.37	5928.34
1/19/2004	7.8	5987.33	5612.37
1/20/2004	7.7	5972.53	5628.38
1/21/2004	7.6	5979.84	5393.99
1/22/2004	7.6	6033.43	5342.91
1/23/2004	7.7	5530.10	4117.37
1/24/2004	7.5	6095.17	5126.60
1/25/2004	7.6	5217.06	5856.18
1/26/2004	7.9	5408.20	5715.13
1/27/2004	7.8	5945.34	4822.31
1/28/2004	7.4	5305.26	4257.57
1/29/2004	7.7	5646.74	4875.80
1/30/2004	7.8	5294.48	4813.81
1/31/2004	7.8	5317.79	5545.12

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
2/1/2004	7.6	5508.53	5007.79
2/2/2004	7.6	5467.93	4902.62
2/3/2004	7.4	5562.85	5253.38
2/4/2004	7.8	5233.95	5995.40
2/5/2004	7.8	5034.26	6317.09
2/6/2004	7.9	5409.78	6248.28
2/7/2004	7.8	5559.80	5336.15
2/8/2004	7.8	5375.11	5286.88
2/9/2004	7.6	5246.70	4042.45
2/10/2004	7.4	5196.16	3852.63
2/11/2004	7.5	5185.54	3571.73
2/12/2004	7.3	5206.58	4844.25
2/13/2004	8.0	5151.54	6255.06
2/14/2004	8.1	4926.80	5561.32
2/15/2004	9.0	1553.93	5078.21
2/16/2004	9.7	0.00	4847.37
2/17/2004	9.7	0.00	4752.17
2/18/2004	9.7	0.00	4917.03
2/19/2004	9.7	0.00	4930.17
2/20/2004	9.7	331.23	6547.58
2/21/2004	9.7	0.00	6408.40
2/22/2004	9.8	0.00	6015.03
2/23/2004	9.8	0.00	5959.18
2/24/2004	9.8	0.00	6413.27
2/25/2004	9.7	0.00	5946.95
2/26/2004	9.8	0.00	5569.93
2/27/2004	9.7	0.00	5691.70
2/28/2004	9.7	130.49	5354.97
2/29/2004	9.6	0.00	6294.20
3/1/2004	9.7	0.00	5777.13
3/2/2004	9.3	1197.93	5637.12
3/3/2004	8.7	1922.04	6001.35
3/4/2004	9.6	0.00	6251.14
3/5/2004	9.6	0.00	6823.82
3/6/2004	10.1	0.00	5409.77
3/7/2004	9.9	0.00	5873.98
3/8/2004	10.0	0.00	3722.75
3/9/2004	10.4	0.00	4427.95
3/10/2004	10.0	0.00	3969.27
3/11/2004	9.7	71.03	4262.60
3/12/2004	9.6	0.00	4651.26
3/13/2004	9.5	0.00	4691.19
3/14/2004	9.7	0.00	5137.03
3/15/2004	9.9	23.12	5857.81
3/16/2004	9.0	1360.86	5518.11
3/17/2004	8.4	1902.08	5078.05
3/18/2004	8.6	1871.56	6382.93
3/19/2004	8.4	1919.02	6127.80
3/20/2004	8.5	1931.49	5752.94
3/21/2004	9.1	1054.19	6280.30
3/22/2004	10.1	0.00	6223.21
3/23/2004	10.2	0.00	6684.70
3/24/2004	10.1	0.00	5995.91
3/25/2004	10.0	0.00	5789.28
3/26/2004	9.5	890.16	5556.08
3/27/2004	8.9	2049.59	5347.45
3/28/2004	8.8	2048.39	5185.36

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
3/29/2004	8.9	2045.84	5224.92
3/30/2004	9.0	2071.29	5684.91
3/31/2004	8.8	2069.93	5279.01
4/1/2004	9.0	2061.87	5280.68
4/2/2004	8.9	2059.51	4311.25
4/3/2004	8.8	2061.98	3640.47
4/4/2004	8.8	2063.15	3964.29
4/5/2004	8.9	2072.26	5490.77
4/6/2004	9.0	1981.85	6419.49
4/7/2004	9.2	2064.43	6795.30
4/8/2004	9.6	2004.37	6913.09
4/9/2004	9.6	2020.95	7017.96
4/10/2004	9.5	1723.95	5956.83
4/11/2004	9.2	1992.94	7276.23
4/12/2004	9.2	2569.44	7320.65
4/13/2004	8.0	4652.41	7272.04
4/14/2004	7.4	5434.75	5893.62
4/15/2004	7.5	5402.28	5932.54
4/16/2004	7.4	5421.85	5535.10
4/17/2004	7.5	5636.83	5589.23
4/18/2004	7.5	5657.54	5550.84
4/19/2004	7.5	5629.79	5667.90
4/20/2004	7.4	5549.54	4953.83
4/21/2004	7.3	5572.32	4427.79
4/22/2004	7.9	5580.09	4973.66
4/23/2004	7.7	5530.40	6211.80
4/24/2004	7.8	5653.30	6370.30
4/25/2004	7.6	5545.03	6607.06
4/26/2004	7.5	5545.29	6220.68
4/27/2004	7.4	5526.39	5968.04
4/28/2004	7.5	5584.62	4451.99
4/29/2004	7.1	5459.54	2825.11
4/30/2004	7.2	5380.85	2968.91
5/1/2004	7.4	5499.35	2889.27
5/2/2004	7.6	5386.58	3643.68
5/3/2004	7.6	5581.42	4163.76
5/4/2004	7.8	5508.81	5156.36
5/5/2004	7.8	5375.74	5981.01
5/6/2004	8.0	5491.47	6708.60
5/7/2004	8.1	5461.00	6817.50
5/8/2004	7.9	5478.89	6936.75
5/9/2004	7.8	5498.36	6798.30
5/10/2004	7.8	5415.91	7224.95
5/11/2004	8.0	5463.51	6972.18
5/12/2004	7.9	5480.53	5662.67
5/13/2004	8.0	5346.82	6548.62
5/14/2004	7.9	5456.76	6571.57
5/15/2004	7.7	5384.54	6324.84
5/16/2004	7.8	5049.08	6430.54
5/17/2004	7.8	4611.04	5359.66
5/18/2004	7.8	5520.97	6785.93
5/19/2004	8.1	5291.43	6525.23
5/20/2004	7.8	5297.21	5266.82
5/21/2004	7.7	5509.88	5103.66
5/22/2004	7.0	4871.19	4227.70
5/23/2004	7.7	3427.46	3955.77
5/24/2004	7.9	5189.17	5640.65

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
5/25/2004	7.8	5499.30	4792.99
5/26/2004	7.3	5495.88	4876.01
5/27/2004	7.7	5525.52	4414.48
5/28/2004	7.8	5522.95	4468.34
5/29/2004	7.8	5567.32	5575.55
5/30/2004	7.7	5538.46	5472.50
5/31/2004	7.7	5454.49	6169.31
6/1/2004	7.5	5497.72	4492.07
6/2/2004	7.6	5570.29	5193.60
6/3/2004	7.6	5536.41	5135.91
6/4/2004	7.7	5493.59	5044.09
6/5/2004	7.8	5442.19	4854.81
6/6/2004	7.7	5541.49	5012.31
6/7/2004	7.7	5572.04	4799.36
6/8/2004	7.8	5550.79	5017.60
6/9/2004	7.6	5500.48	4916.19
6/10/2004	7.9	5452.03	5298.77
6/11/2004	8.0	5534.62	5734.40
6/12/2004	7.8	5399.30	6198.99
6/13/2004	7.8	5345.05	6232.36
6/14/2004	7.8	5541.88	6556.47
6/15/2004	7.9	5527.56	5814.72
6/16/2004	7.9	5500.44	5354.68
6/17/2004	8.7	2504.86	5353.01
6/18/2004	9.6	0.00	6102.19
6/19/2004	9.6	0.00	6027.66
6/20/2004	9.4	0.00	5874.28
6/21/2004	9.5	0.00	5944.64
6/22/2004	9.7	0.00	6008.06
6/23/2004	8.8	2448.87	4672.51
6/24/2004	7.4	5552.92	4885.37
6/25/2004	7.4	5411.37	5087.63
6/26/2004	7.5	5387.10	5534.13
6/27/2004	7.6	5336.38	5674.49
6/28/2004	7.7	5475.89	7227.33
6/29/2004	7.7	5432.69	6384.24
6/30/2004	7.7	5448.57	5939.68
7/1/2004	7.7	5495.77	6335.07
7/2/2004	7.5	5489.46	6607.86
7/3/2004	7.5	5470.21	6963.20
7/4/2004	7.7	5437.20	7226.55
7/5/2004	7.6	6093.01	7806.54
7/6/2004	7.6	5863.27	6502.73
7/7/2004	8.0	5934.30	5832.01
7/8/2004	7.7	6473.90	7234.37
7/9/2004	7.5	6443.09	7418.00
7/10/2004	7.5	6464.41	7167.46
7/11/2004	7.6	6431.30	6754.31
7/12/2004	7.4	6472.04	5775.65
7/13/2004	7.8	3813.65	5576.14
7/14/2004	7.8	3063.30	5592.67
7/15/2004	6.9	2704.15	5208.90
7/16/2004	7.8	4242.29	5835.48
7/17/2004	8.0	4007.31	5720.56
7/18/2004	7.8	4139.27	6609.96
7/19/2004	7.6	4093.77	5970.30
7/20/2004	7.3	4084.92	6857.11

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
7/21/2004	3.1	4858.99	5784.25
7/22/2004	7.5	6562.37	5439.84
7/23/2004	7.3	6503.58	5376.89
7/24/2004	7.2	5882.33	6248.49
7/25/2004	7.8	5006.59	6483.96
7/26/2004	7.6	5842.53	7337.17
7/27/2004	7.5	5413.55	7671.15
7/28/2004	7.4	5457.06	5522.78
7/29/2004	7.5	5453.24	6824.61
7/30/2004	9.2	5479.10	6644.05
7/31/2004	9.4	5360.15	5494.34
8/1/2004	9.0	5385.27	5206.29
8/2/2004	7.8	5468.03	4929.01
8/3/2004	8.0	5415.50	4753.77
8/4/2004	7.9	4241.00	5283.95
8/5/2004	8.0	3499.36	5055.17
8/6/2004	7.9	2258.34	5663.05
8/7/2004	8.3	2788.41	5984.18
8/8/2004	8.5	2722.70	5588.59
8/9/2004	8.2	2674.11	5003.85
8/10/2004	8.1	2686.91	4668.43
8/11/2004	7.9	2738.61	4392.89
8/12/2004	8.1	2715.24	4788.86
8/13/2004	8.2	2776.31	4535.44
8/14/2004	8.5	2760.89	6893.16
8/15/2004	8.4	2754.65	7086.99
8/16/2004	8.4	2870.88	7249.03
8/17/2004	8.4	2793.75	5318.45
8/18/2004	8.4	2784.22	7115.47
8/19/2004	8.2	2958.63	6718.94
8/20/2004	8.8	1524.39	5927.44
8/21/2004	8.3	2939.58	7410.76
8/22/2004	8.1	2973.07	7704.73
8/23/2004	8.2	2928.44	7083.96
8/24/2004	8.4	2890.66	7217.61
8/25/2004	8.6	2912.59	6296.52
8/26/2004	8.2	3477.84	5542.25
8/27/2004	8.1	3498.15	5595.85
8/28/2004	8.1	3453.71	6356.76
8/29/2004	8.0	3571.25	6169.12
8/30/2004	8.5	2193.31	5521.13
8/31/2004	8.8	1862.67	5735.16
9/1/2004	8.2	2964.61	4515.02
9/2/2004	8.3	3006.39	4523.02
9/3/2004	8.3	3484.35	4854.18
9/4/2004	8.1	3955.23	4950.90
9/5/2004	8.2	4041.77	5301.96
9/6/2004	8.0	4023.46	5685.39
9/7/2004	7.6	3104.34	3095.42
9/8/2004	8.6	1588.05	3551.25
9/9/2004	7.6	4416.52	6367.61
9/10/2004	7.6	5151.66	6312.24
9/11/2004	7.7	5053.26	6242.34
9/12/2004	7.7	4961.56	5812.93
9/13/2004	7.7	5128.40	4909.44
9/14/2004	7.3	5233.54	4930.55
9/15/2004	7.4	5145.10	5497.67

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
9/16/2004	7.5	5043.76	6350.80
9/17/2004	7.6	4939.90	6410.39
9/18/2004	7.5	5110.90	5983.90
9/19/2004	7.7	5126.27	5949.77
9/20/2004	8.1	3598.49	6137.77
9/21/2004	8.1	3280.74	5623.14
9/22/2004	8.1	3241.95	4871.85
9/23/2004	8.1	3109.97	5391.12
9/24/2004	8.1	3278.93	6918.09
9/25/2004	8.1	3317.28	6312.97
9/26/2004	8.0	3292.83	6395.26
9/27/2004	7.9	3573.32	5975.90
9/28/2004	7.1	4706.48	5974.03
9/29/2004	7.5	4864.60	6579.51
9/30/2004	7.8	3688.10	6862.19
10/1/2004	8.2	3340.49	6358.54
10/2/2004	8.8	1725.79	6148.25
10/3/2004	8.8	2153.41	5761.36
10/4/2004	8.2	3377.06	5682.17
10/5/2004	8.2	3301.91	4939.70
10/6/2004	8.0	3294.21	3522.31
10/7/2004	7.9	3316.91	3985.21
10/8/2004	7.9	3318.24	3783.23
10/9/2004	8.0	3335.86	4476.45
10/10/2004	7.9	3333.91	4714.87
10/11/2004	7.9	3280.52	4647.97
10/12/2004	8.0	3256.33	4981.70
10/13/2004	8.0	3263.00	5357.52
10/14/2004	7.9	3288.67	6238.54
10/15/2004	8.0	3354.18	7197.66
10/16/2004	7.9	3382.76	7406.80
10/17/2004	8.1	3322.95	7023.01
10/18/2004	8.2	2537.95	5865.24
10/19/2004	8.4	2862.08	4758.68
10/20/2004	8.6	0.00	6.11
10/21/2004	9.2	0.00	2617.80
10/22/2004	8.7	3500.00	5255.01
10/23/2004	7.8	4000.00	6896.05
10/24/2004	7.9	4600.00	6722.28
10/25/2004	7.8	5470.00	7047.85
10/26/2004	7.9	5200.00	7066.01
10/27/2004	7.8	5420.00	6685.22
10/28/2004	7.9	4750.00	7194.00
10/29/2004	7.7	4800.00	7022.97
10/30/2004	8.0	2915.00	6897.65
10/31/2004	8.2	3720.00	6656.22
11/1/2004	8.4	3100.00	7188.93
11/2/2004	8.9	2780.00	5565.36
11/3/2004	8.3	2900.00	6764.68
11/4/2004	8.2	3110.00	5995.06
11/5/2004	8.3	3125.00	6958.39
11/6/2004	8.5	2920.00	6851.70
11/7/2004	8.5	3070.00	6907.60
11/8/2004	8.3	3115.00	7018.19
11/9/2004	8.4	2940.00	5819.67
11/10/2004	8.2	3340.00	6355.69
11/11/2004	8.1	3275.00	7345.35

	Tailings pH at North Splitter Box	Acid Water Pumping through WDPS	Concentrator Throughput
11/12/2004	8.2	3480.00	6356.17
11/13/2004	8.2	3320.00	6134.68
11/14/2004	8.2	2920.00	5996.38
11/15/2004	8.6	1440.00	6024.79
11/16/2004	9.3	0.00	5594.47
11/17/2004	9.5	0.00	5265.23
11/18/2004	9.6	0.00	5065.65
11/19/2004	9.6	0.00	5448.28
11/20/2004	9.7	0.00	5623.56
11/21/2004	9.8	0.00	5647.17
11/22/2004	9.3	1000.00	6518.56
11/23/2004	8.3	2420.00	7714.45
11/24/2004	8.2	2860.00	7531.14
11/25/2004	8.3	2900.00	7402.47
11/26/2004	8.1	2880.00	7231.59
11/27/2004	7.9	2905.00	7442.99
11/28/2004	7.7	2880.00	6682.11
11/29/2004	8.0	3055.28	7601.37
11/30/2004	8.4	2919.97	6769.80
12/1/2004	8.1	3145.26	6786.45
12/2/2004	8.1	3661.79	6750.77
12/3/2004	8.2	3685.81	6992.02
12/4/2004	8.3	3652.79	7065.07
12/5/2004	8.3	3639.89	7081.35
12/6/2004	8.2	3119.42	6978.77
12/7/2004	8.1	3675.52	7244.89
12/8/2004	8.0	3642.75	6663.94
12/9/2004	8.1	3981.35	6890.55
12/10/2004	8.0	3771.28	6839.81
12/11/2004	8.1	3691.96	5965.52
12/12/2004	8.0	3676.79	5353.28
12/13/2004	7.8	3672.25	4845.95
12/14/2004	7.7	3637.19	4286.77
12/15/2004	7.8	3581.34	4087.55
12/16/2004	8.1	3602.84	5311.50
12/17/2004	8.2	3688.38	5877.78
12/18/2004	8.3	3605.16	6587.23
12/19/2004	8.3	3597.31	6776.35
12/20/2004	8.1	3545.18	4713.18
12/21/2004	8.4	2891.99	7066.16
12/22/2004	8.4	2705.74	6727.67
12/23/2004	8.5	2772.22	7221.91
12/24/2004	8.6	2682.94	7209.91
12/25/2004	8.5	2717.75	6748.24
12/26/2004	8.4	2756.50	6556.13
12/27/2004	8.3	2790.62	6035.11
12/28/2004	8.2	2783.77	5979.60
12/29/2004	8.0	4128.30	6944.73
12/30/2004	8.4	4634.08	7059.75
12/31/2004	8.6	4605.65	6512.52

**Table C-2 Monthly Tailings Aqueous Chemistry Monitoring Data 2003-2004**

Sample	Date	pH	TDS mg/l	Alk mg/l CaCO <sub>3</sub>	Acidity mg/l CaCO <sub>3</sub>	Ca-T mg/l	Mg-T mg/l	Cl mg/l	SO <sub>4</sub> mg/l	Al-D ug/l	Cd-D ug/l	Cu-D ug/l	Fe-D ug/l	Mn-D ug/l	Zn-D ug/l
BCP2739	1/15/03	8.03	7510	87		877	345	2130	2580	<100	4	11	663	2110	
BCP2739	2/19/03	7.81	7000	74		744	252	2030	3160		2	380	750		
BCP2739	3/19/03	8.3	7500	70		768	289	2040	2820	155	2	36	380	2260	
BCP2739	4/23/03	10.03	6130	79		871	163	1640	2540	<100	2	16	<30	1450	
BCP2739	5/14/03	8.82	8080	74		946	210	2500	2470	108	5	<10	40	1260	
BCP2739	6/25/03	8.81	7380	62		1270	9	2490	2830	105	5	<10	<30	570	
BCP2739	7/29/03	8.86	7160	35		1010	118	2090	2350	170	3	<10	<30	27	
BCP2739	8/27/03	8.69	6760	59		903	119	2110	2340	368	5	21	425000	49	
BCP2739	9/16/03	7.78	7460	52		829	131	2210	2640	<100	6	<10	39000	137	
BCP2739	10/11/03	8.5	8410	76		1100	221	2640	2440	230	9	46	28900	48	
BCP2739	11/11/03	8.37	7240	78		919	150	2310	2350	138	5	<10	4390	33	
BCP2739	12/16/03	7.95	6180	89		750	148	1690	2280		3	<10	23200	1480	
BCP2739	1/13/04	8.23	5210	86		651	94	1470	1940	<100	5	40	16140	1310	
BCP2739	2/17/04	8.11	5730	106		679	164	1490	2210	<100	6	163	51900	2300	
BCP2739	3/30/04	8.49	6610	79	11	790	142	2090	2460	27	<20	<20	<300	1040	
BCP2739	4/20/04	8.08	6390	66		897	95	1880	2590	314	4	24	45300	624	
BCP2739	5/18/04	7.61	5390	70		781	112	1420	1900	<100	<0.01	166	<300	805	
BCP2739	6/15/04	8.36	5820	93		681	135	1640	2270	<100	<0.01	753	<300	710	
BCP2739	7/13/04	8.09	6490	79		769	151	1880	2560	<100	<0.01	<10	<20	892	
BCP2739	8/24/04	8.12	7710	72		848	191	2240	2690	<100	<0.01	<10	<20	750	
BCP2739	9/21/04	8.09	8270	58	10	920	249	2430	2940	<100	<0.01	<10	<20	1035	
BCP2739	10/26/04	8.24	7110	75	18	887	215	2070	2930	<100	1.6	<15	<20	843	
BCP2739	11/16/04	8.48	7810	66		940	224	2170	2760	<100	<0.01	<15	<20	888	
BCP2739	12/21/04	8.48	8260	75		952	233	2220	2780	<100	<0.01	<15	46	980	
BCP2750	1/15/03	9.43	6850	34		887	197	1860	2660	<15	3	<20	<300	30	
BCP2750	2/19/03	10.3	6850	26		1000	173	1880	3610	226	2			16	
BCP2750	3/19/03	9.28	6550	32		1010	217	1800	2600	368	2	<20	<300	86	
BCP2750	4/23/03	10.05	57790	44		1030	38	1520	2220	<15	2	<20	<300	25	
BCP2750	5/14/03	9.93	6040	45		999	12	2050	2330	35	2	21	<300	30	
BCP2750	6/25/03	10.2	7090	40		1410	14	2350	2600	<15	4	24	<300	<10	
BCP2750	7/29/03	10.2	6640	46		1190	3	1960	2210	37	2	<20	<300	10	
BCP2750	8/27/03	10.6	6670	55		1170	4.1	2020	2150	63	4	<20	<300	11	
BCP2750	9/16/03	9.85	6560	36		1190	4.9	1920	2350	<15	4	<20	<300	14	

Sample	Date	pH	TDS	Alk	Acidity	Ca-T	Mg-T	Cl	SO4	Al-D	Cd-D	Cu-D	Fe-D	Mn-D	Zn-D
		su	mg/l	mg/l CaCO3	mg/l CaCO3	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
BCP2750	10/1/03	10.1	7400	41		1310	21	2430	2280	15	4	<20	<300	<10	<10
BCP2750	11/11/03	10	6280	31		974	33.3	2050	2220	<15	5	<20	<300	<10	<10
BCP2750	12/16/03	10.37	5980	41		1040	31	1650	2240	<15	3	<20	<300	<10	<10
BCP2750	1/13/04	9.8	5140	27		930	36	1390	1860	17	3	<20	<300	21	<10
BCP2750	2/17/04	10.05	5560	36		895	42	1370	2140	8	2	<20			<20
BCP2750	3/30/04	10.6	6440	54	<10	1090	6	2040	2310	218	<20	20	474		<40
BCP2750	4/20/04	10.19	6030	39		1070	11	1800	2420		3	<30	<300	<0.01	<10
BCP2750	5/18/04	10.3	5190	50		888	6	1340	1870	<100	<0.01	<10	<300	<0.01	<20
BCP2750	6/15/04	9.72	5500	42		15	1470	2000	<100	<0.01	2400	<300	<0.01	<20	<20
BCP2750	7/13/04	9.91	5770	39		921	20.2	1690	2320		<0.01	<15	<20	<0.01	<20
BCP2750	8/24/04	10.09	7340	57		1220	25	2170	2800		<0.01	<10	<20	<0.01	<20
BCP2750	9/2/04	10.09	7620	26	<10	1200	34	2190	2560	<100	<0.01	<10	<20	<0.01	<20
BCP2750	10/26/04	10.3	6680	32	13	1100	44	1910	2660	<100	0.15	<15	<20	1.79	<20
BCP2750	11/16/04	10.17	7530	42		1150	101	2070	2560	<100	<0.01	<15	<20	<0.01	<20
BCP2750	12/21/04	10.36	7640	34		1090	89	2090	2760	<100	<0.01	<15	<20	<0.01	<20
BYP2535	1/15/03	6.87	8160	132		856	499	1730	3790	<15	2	20	329	13000	104
BYP2535	2/19/03	7.43	8020	122		909	431	1770	4510	222	2	<20	<300	3850	43
BYP2535	3/19/03	7.68	8080	94		862	428	1780	3690	121	2	<20	<300	2720	15
BYP2535	4/23/03	7.96	6560	60		693	322	1380	3500	242	2	34	<300	523	37
BYP2535	5/14/03	10	6660	59		756	10	2080	3500	<15	<1	22	<300	321	25
BYP2535	6/25/03	8.49	7000	55		1040	201	2080	2280	299	3	34	<300	321	25
BYP2535	7/29/03	8.34	6950	46		979	123	1790	2680	185	2	<20	<300	6490	40
BYP2535	8/27/03	7.53	7450	91		927	388	1760	3280	236	7	464	<300	321	25
BYP2535	9/16/03	9.84	6460	34		1120	38	1880	2470	<15	3	32	<300	6790	20
BYP2535	10/1/03	8.55	7220	56		1420	209	2090	2780	27	4	20	<300	608	752
BYP2535	11/11/03	7.67	9830	110		1090	399	1890	3240	155	8	67	<300	304	<10
BYP2535	12/16/03	7.77	8350	84		1180	580	1410	3490	162	8	85	300	11700	18
BYP2535	1/13/04	6.7	7310	133		1110	571	1100	4390	60	21	77	608	36200	82
BYP2535	2/17/04	10.14	5600	35		930	43	1360	2370	<15	2	<20	<300	4440	19
BYP2535	3/30/04	8.99	7340	55		1180	147	1920	3280	218	3	28	<300	304	<10
BYP2535	4/20/04	7.26	8480	146		966	712	1370	4510	<100	12	436	403	19600	22
BYP2535	5/18/04	7.72	7250	88		1230	356	1190	3800	318	4	87	<300	3330	22
BYP2535	6/15/04	7.68	7340	81		1020	312	1380	3680	318	5	4440	<300	4850	19
BYP2535	7/13/04	6.74	8770	139		1100	349	1470	4280	71	3	<20	3010	20400	188
BYP2535	8/24/04	8.42	7700	57		1240	260	2050	3700	490	5	21	<300	1760	18

Sample	Date	pH	TDS	Alk	Acidity	Ca-T	Mg-T	Cl	SO4	Al-D	Cd-D	Cu-D	Fe-D	Mn-D	Zn-D
		su	mg/l	mg/l CaCO3	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
BYP2535	9/21/04	8.03	8390	94		1280	333	2050	3100	392	4	<20	<300	2710	16
BYP2535	10/26/04	7.76	8720	102	20	1340	541	1750	4140	244	8	108	<300	1190	20
BYP2535	11/16/04	10.16	7260	38		1120	101	2020	2480	<20	3	<20	<300	<0.01	29
BYP2535	12/21/04	9.34	8020	47		1160	202	1970	3120	110	3	<20	<300	350	<10
BYP2538	1/15/03	3.92	30700	<5		9860	533	3450	167	20100	1E+06	292	44300	467000	79400
BYP2538	2/19/03	3.8	27400			9070	568	3410	179	24700		162	56000		
BYP2538	3/19/03	3.95	25500	<5		7940	520	3530	175	20000	1E+06	90	31000	478000	113000
BYP2538	4/23/03	3.8	28900	NA		9770	547	3370	162	19600	1E+06	378	82000	316000	192000
BYP2538	5/14/03	No sample collected - VDPS Pumping off													
BYP2538	6/25/03	3.38	15400	NA		5360	492	2290	141	14300	653000	228	60700	50200	108000
BYP2538	7/29/03	3.74	38300			14400	505	4460	193	25200	2E+06	131	35000	1E+06	170000
BYP2538	8/27/03	3.16	33400			10500	464	3650	194	21200	2E+06	30	90000	178000	176000
BYP2538	9/16/03	No sample collected - VDPS Pumping off													
BYP2538	10/1/03	3.69	19200			5070	548	2290	150	11400	661000	480	41000	117000	196000
BYP2538	11/11/03	3.59	31100			14700	497	3210	227	21900	1E+06	480	66000	261000	197000
BYP2538	12/16/03	3.54	28500			8000	435	3230	207	21200	1E+06	360	64000	271000	187000
BYP2538	1/13/04	3.56	19700			4550	537	2260	169	12900	735000	450	44000	128000	171000
BYP2538	2/17/04	No sample collected - VDPS Pumping off													
BYP2538	3/30/04	3.71	30300			8750	345	3520	162	21600	1E+06	432	102000	347000	185000
BYP2538	4/20/04	3.54	25300	<5		7930	412	3220	168	20300	1E+06	330	89000	223000	163000
BYP2538	5/18/04	3.88	24100	<5		7080	451	2890	199	15600	940000	240	42800	312000	113600
BYP2538	6/15/04	3.67	20500			7010	468	2350	185	15700	831000	326	43800	186910	1322000
BYP2538	7/13/04	3.51	26200	<5		7460	449	2710	215	20300	993000	443	59800	207000	175000
BYP2538	8/24/04	3.33	28200	<5		7940	329	3050	166	18600	914000	626	86900	196000	223000
BYP2538	9/21/04	3.59	30800	<5		8440	368	3260	176	22000	1E+06	515	68060	487000	243000
BYP2538	10/26/04	3.37	32500			9770	463	3880	208	24300	1E+06	535	59900	306000	224000
BYP2538	11/23/04	3.49	43500			13200	349	435	188	27900	2E+06	510	100000	665000	310000
BYP2538	12/21/04	3.66	43200			13700	380	4230	215	29000	2E+06	485	85800	819000	278000
MCP2536	1/15/03	6.87	8150	78		691	562	1740	3730	36	2	<20	1390	16200	121
MCP2536	2/19/03	7.81	7480	113		1060	438	1780	3740	353	3				26
MCP2536	3/19/03	7.69	8100	90		878	449	1780	3540	128	2	<20	<300	4010	26
MCP2536	4/23/03	8	6480	57		593	185	1370	3180	217	2	55	<300	1940	17
MCP2536	5/14/03	9.89	7010	42		756	8	2080	2350	<15	3	23	<300	<10	17
MCP2536	6/25/03	8.56	7240	45		964	186	2150	3070	139	3	34	<300	322	32
MCP2536	7/29/03	8.34	6860	37		874	110	1790	2540	144	2	<20	<300	278	18

Sample	Date	pH	TDS	Alk	Acidity	Ca-T	Mg-T	Cl	SO4	Al-D	Cd-D	Cu-D	Fe-D	Mn-D	Zn-D
		su	mg/l	mg/l CaCO3	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
MCP2536	8/27/03	10.3	6590	44		1130	4	1980	2210	181	4	<20	1050	20	17
MCP2536	9/16/03	9.66	6080	34		1100	46	1820	2190	16	3	<20	<300	<10	10
MCP2536	10/1/03	6.8	7100	47		1280	167	2090	2750	78	4	26	<300	703	11
MCP2536	11/11/03	7.86	7330	97		1120	365	1860	3320	246	6	<20	1160	4640	26
MCP2536	12/16/03	7.76	7830	75		1050	478	1380	3460	131	3	<20	<300	11100	23
MCP2536	1/13/04	7.78	6630	94		1080	379	1060	3720	127	2	<20	<300	12000	22
MCP2536	2/17/04	9.76	5570	32		959	43	1350	2260	<115	2	<30	<20	<10	<10
MCP2536	3/30/04	8.95	7000	53		1040	118	1880	3130	82	<20	12	<300	138	<60
MCP2536	4/20/04	7.69	7480	97		940	483	1540	4000	<100	3	11	<300	8410	16
MCP2536	5/18/04	7.85	6920	75		10000	316	1240	3520	<100	<0.01	<10	<300	3140	<20
MCP2536	6/15/04	7.52	6970	71		10600	297	1250	3610	131	<0.01	<10	<300	2990	<20
MCP2536	7/13/04	7.04	7310	89		829	443	1260	3950	106	<0.01	<10	<20	9545	<20
MCP2536	8/24/04	8.23	7690	42		1100	223	2020	3542	<100	<0.01	<10	<20	615	<20
MCP2536	9/21/04	7.88	8020	66	<10	1100	287	1900	3200	170	<0.01	<10	<20	1630	<20
MCP2536	10/27/04	7.74	8170	78		1050	472	1820	3860	<10	<15	<20	<0.01	<20	<20
MCP2536	11/16/04	9.85	7050	35		1100	93	1970	2640	<100	<0.01	<15	<20	<0.01	<20
MCP2536	12/21/04	8.8	7910	50		1050	281	1560	2980	<100	<0.01	<15	<20	<0.01	<20

BGP2739 Inflow from Copperton Reservoir to Copperton Concentrator

BGP2750 Flow from Tailing Underflow 1 to NP-5

BYP2538 Flow from Wastewater pumping to NP-5

BYP2535 Flow into NP-6A

MCP2536 Flow into North Splitter Box

**APPENDIX D**

**Tailings Monitoring Report**

## **TECHNICAL MEMORANDUM**

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**DATE:** 24 April 2005

**TO:** Kelly Payne (KUCC)

**FROM:** Mark J. Logsdon (Geochimica)

**SUBJECT: MONITORING MANAGEMENT OF ACID-PLUME WATER  
THROUGH THE COPPERTON TAILING LINE -- 2003 - 2004  
ANNUAL REPORT**

*cc: P. Doughty (KUCC), B. Vinton, B. Yeomans (NAMS)*

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### **BACKGROUND**

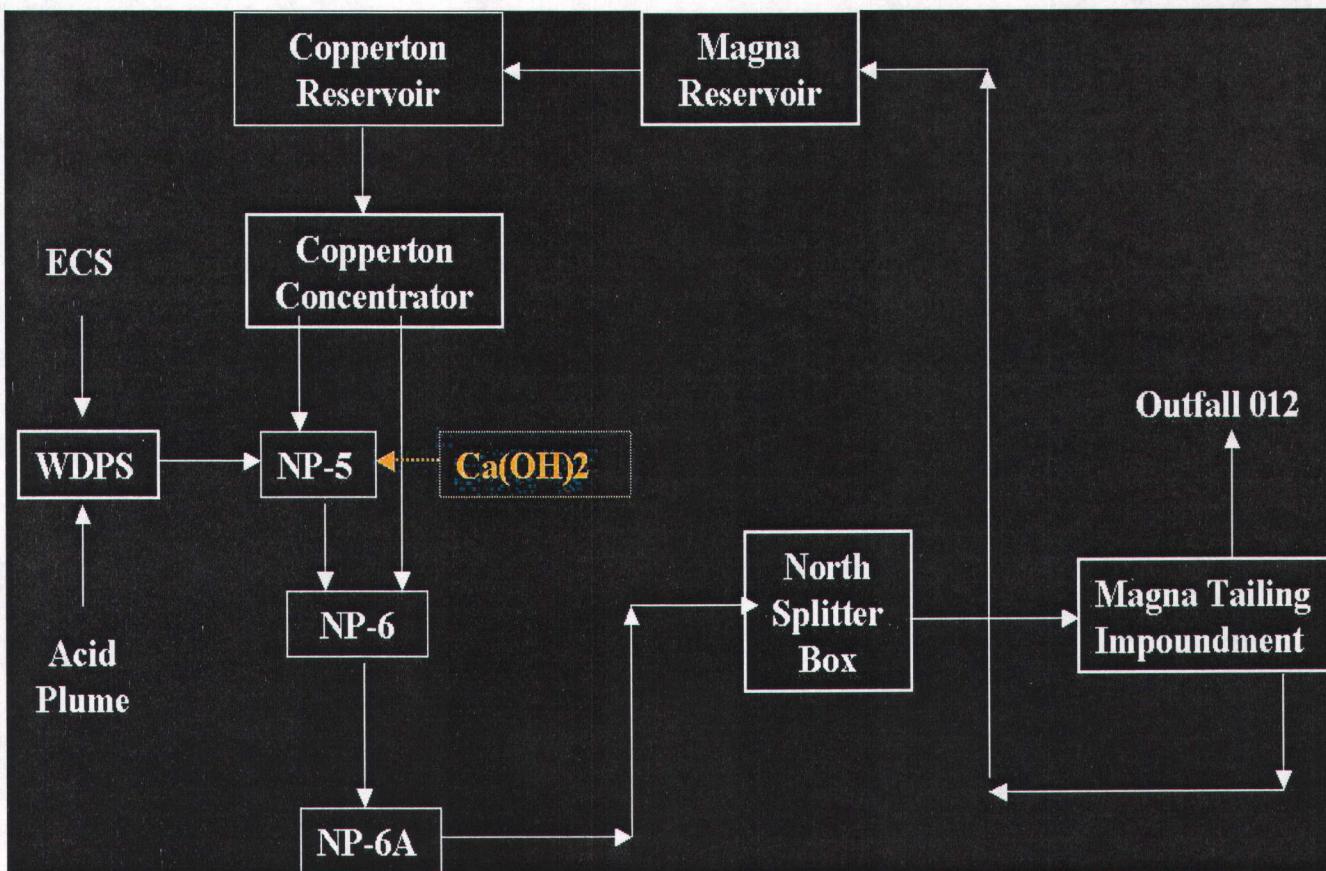
In December 2002, Kennecott Utah Copper Corporation (KUCC) submitted the “Final Design Report for Remedial Action at South Facilities Groundwater” to U.S. Environmental Protection Agency, Utah Department of Environmental Quality, the Technical Review Committee and the general public. KUCC organized the remedy into three functional, engineering units: 1) containment and extraction of contaminated groundwater, 2) treatment of sulfate contaminated water in the Zone A Reverse Osmosis (RO) facility to produce municipal quality water, and 3) neutralization of acidic groundwater in the tailings line using the naturally occurring neutralization potential of the tails and, if necessary or convenient, supplemental lime added to the tails. This report addresses the third component of the overall program.

While the mine is operating, KUCC conveys the following mining-affected waters to the Magna Tailings Impoundment in two existing tailings pipelines:

- Acid plume water;
- Meteoric drainage from the Eastside Collection System; and
- RO Concentrates from treatment of the Zone A sulfate plume.

These water are commingled in and pumped through the Wastewater Disposal Pump Station (WDPS).

Figure 1 Schematic Diagram of Acid-Water Addition to the Copperton Tailing System



The process diagram is discussed in detail in the Final Design Report. The colored box titled “Ca(OH)2” indicates KUCC’s capacity to add additional lime at the process circuit if needed to maintain pH at North Splitter Box.

With respect to the disposal of acid waters in the tailing system, the Remedial Design proposed three performance criteria:

- The system must be able to handle up to 3,500 gpm flow of acidic water from the Wastewater Disposal Pump Station (WDPS)
- The system must be able to maintain a fluid pH of 6.7 or greater as measured at the North Splitter Box (Sample Point MCP2536) with 90% availability to ensure dissolved metal precipitation and sequestration in the tailings impoundment
- The system must be integrated with the existing tailing disposal system so that:
  1. KUCC will meet all UPDES discharge criteria at Outfall 012 from the North Impoundment to Great Salt Lake (or other permitted outfalls).
  2. The acid-base balance of the tailing is not adversely affected by the addition of acidic flows from WDPS.

The Final Design Report proposed a complicated formula for the third criterion, involving comparisons of the Net Neutralization Potential values for the Copperton Concentrator General Mill Tailings (GMT) and samples of tailings collected at North Splitter Box, immediately before final routing to the Magna Impoundment.

### **Purpose and Objectives**

The purpose of this memorandum is to evaluate management during Calendar-Years 2003 and 2004 of acid-plume water through the Copperton tailing line with respect to the performance criteria.

Specific objectives include:

- Summarizing the monitoring data;
- Evaluating the pH and Net Neutralization Potential criteria during 2003 and 2004;
- Describing the technical basis for proposing a simpler criterion for evaluating the acid-base balance, based on using a combination of pH and Neutralization Potential (not Net Neutralization Potential).

KUCC reports and manages the UPDES program separately. The performance objective related to UPDES discharge is outside the scope of this review.

### **RESULTS FOR 2003 - 2004**

Attachment 1 summarizes the flow and the pH conditions at North Splitter Box. The graphs show 7-day-average values for tons of tailing produced per day, combined acid-water flows through the WDPS, and the output pH at North Splitter Box.

Attachment 2 summarizes the acid-base data (as net-neutralization potential) on a monthly basis, using the statistical process originally proposed in 2002. During 2003 and 2004, the Copperton Concentrator processed approximately 6,000 tons per hour of ore (Attachment 1). As shown in Appendix C to the Remedial Design Report, the tailing line behaves as a plug-flow reactor, meaning that flow of solids at NSB also is 6,000 tons per hour. This is equivalent to 144,000 tons per day, or 100 tons per minute. Under these flow conditions, grab samples have limitations. Following reviews of test data in 2003, KUCC installed a composite sampler at North Splitter Box to better represent the tailing properties there in future testing.

KUCC separately reports its UPDES discharge conditions, which are outside the scope of this discussion.

## DISCUSSION

### 1. Flow

The data in Attachment 1 show that the tailing process circuit can routinely handle flows that meet or exceed the stipulated criteria. The Remedial Design required the ability to handle acidic flows from WDPS up to 3,500 gpm. During 2003, the system managed flows up to 6,100 gpm. There are operational interruptions, including scheduled events such as Concentrator maintenance and unscheduled interruptions due to power failures. In all cases, the flow cutoff is rapid; the system re-builds flow in an orderly manner, and the operational conditions are re-established rapidly.

### 2. pH at North Splitter Box

The data in Attachment 1 also show that the tailing process circuit maintained the pH at North Splitter Box above pH 6.7 su at all times in 2003 and 2004.

### 3. Acid-Base Balance

The tailing slurry discharged from the Copperton Concentrator provides a reservoir of neutralization potential in both the aqueous alkalinity of the slurry-water and in the intrinsic capacity of the tailing solids to neutralize acidity, as shown by the titratable Neutralization Potential. It is clear that acidic water added at Drop Box NP-5 (Figure 1) from the WDPS system will consume some of the total neutralization potential of the combined slurry flowing into and then through NP-5, ultimately reporting through North Splitter Box to the tailing impoundment. The premise of the Remedial Design with respect to this situation is that the total acidity added from WDPS would exert a small demand on the total neutralization such that the basic acid-base balance of the tailing at Magna would be indifferent from that had there been no acid-water addition. Calculations presented in the Final Design Report showed that the demand on NP due to acid-water addition was about 2 t CaCO<sub>3</sub> eq/kt of solids, and tests work conducted during the Remedial Design phase showed that the median NP of tailing was 19 t CaCO<sub>3</sub> eq/kt. As discussed below an din the Design Report, the apparent demand lies within the analytical uncertainty of NP measurements, so there was no basis for considering that the acid-water addition would significantly and adversely affect the overall acid-base balance of the tailing at Magna. [This is not to say that the acid-base condition of the tailing is a matter of no significance; rather, the statement is that disposal of the South Facilities acidic waters would not significantly change the acid-base condition that would exist in any event because of the fundamental AP and NP of the tailing itself.]

In accordance with standard KUCC methodology, the Final Design Report proposed that the acid-base balance at GMT and NSB be evaluated in terms of a calculated parameter called Net Neutralization Potential.

### 3.1 Net Neutralization Potential

NNP is defined as the difference between Neutralization Potential (NP) and Acid Generating Potential (AP):

$$\text{NNP} = \text{NP} - \text{AP}.$$

The AP value in tons CaCO<sub>3</sub> eq/kt is calculated stoichiometrically from the sulfide-sulfur value (AP = 31.25 \* [S wt%]). The Sobek NP value is calculated from an acid-base titration of a sample of the tailing to determine the intrinsic capacity of the tailing sample to neutralize a strong acid.

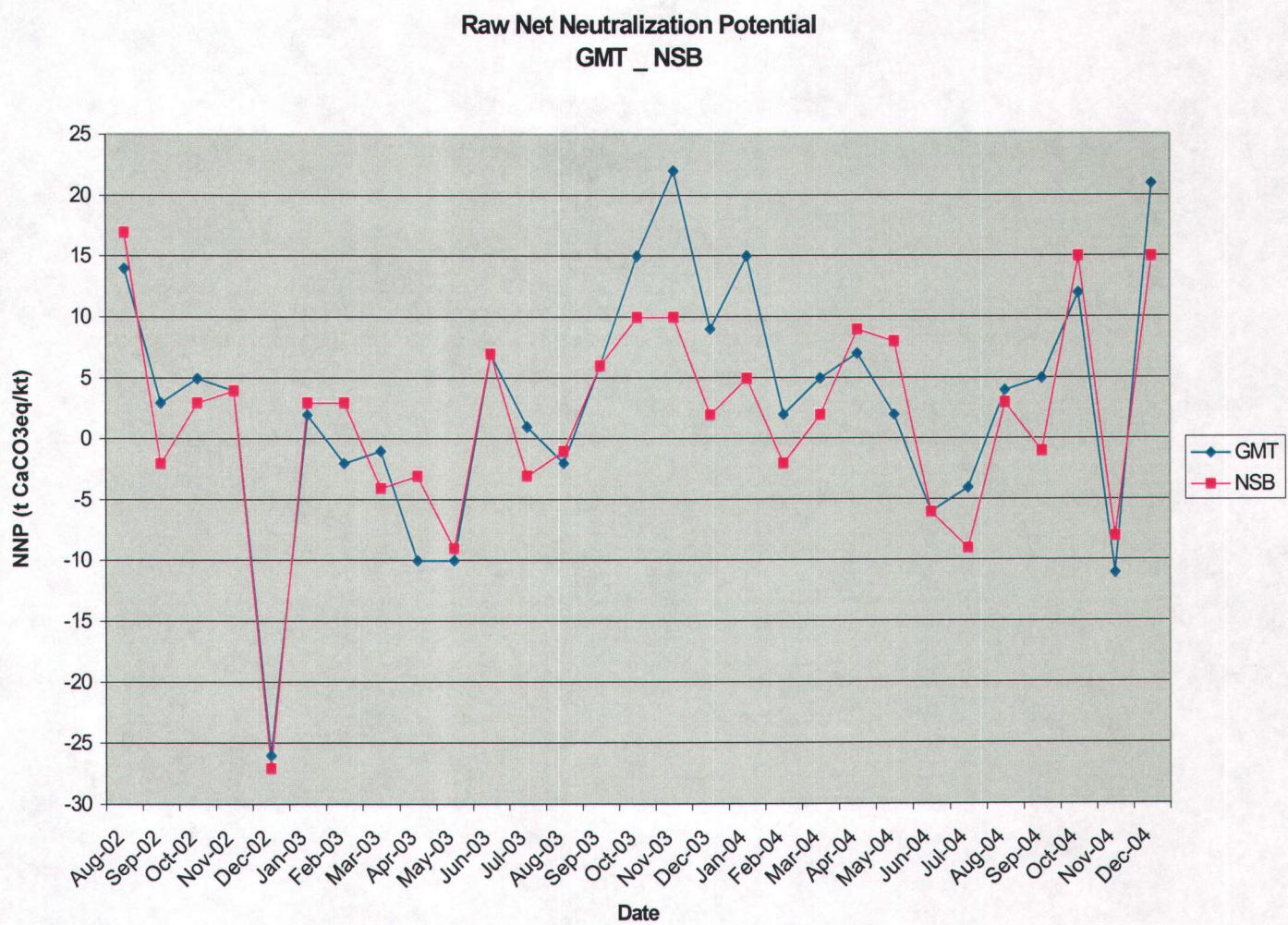
To quantitatively evaluate the composite NNP value, one must understand the analytical precision of the component measurements for AP and NP. The analytical precision (1s) of [S] is approximately 0.1 wt%, so the precision (1s) of AGP is 3.1 tons CaCO<sub>3</sub> eq/kt. The estimated precision of the NP value (determined from an acid-base titration) is approximately 2 t CaCO<sub>3</sub> eq/kt (0.2 wt%). The 1s joint uncertainty in NNP – for both GMT and NSB – samples is the square-root of the sum of the squares of the two uncertainties, or approximately 3.7 tons CaCO<sub>3</sub> eq/kt, and the 2s values (approximately the 95% confidence-interval value) would be 7.4 tons CaCO<sub>3</sub> eq/kt.

Figure 1 presents the month-by-month values for Net Neutralization Potential (NNP) as the tailing leaves the Copperton Concentrator (the standard sample called General Mill Tailings (GMT)) and at North Splitter Box (NSB).

Figure 2 shows two important features for 2003-2004:

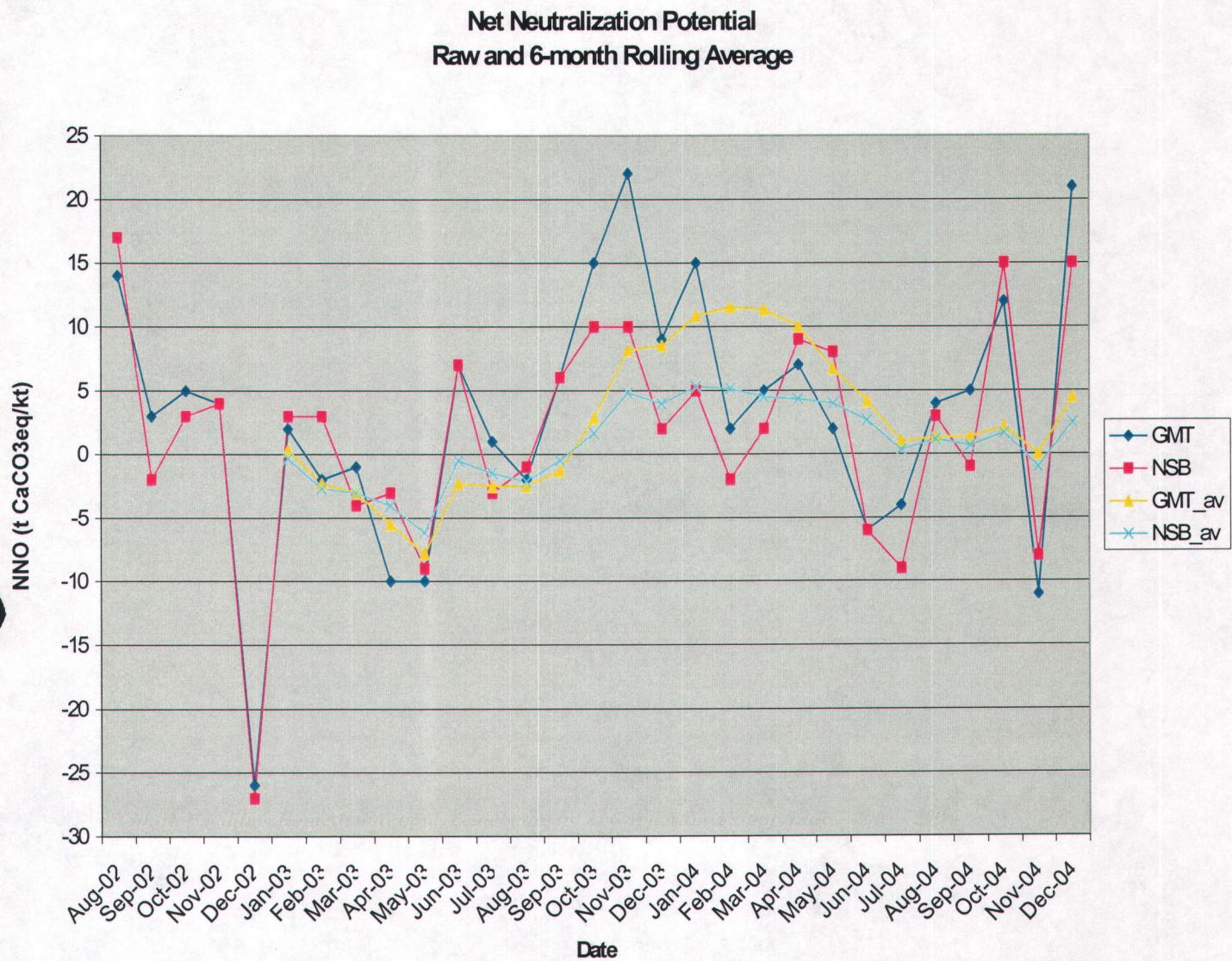
- There are some months in which the NNP value at NSB is greater than that at GMT and other months in which GMT is greater. There is no general trend of these results, neither with respect to time (the reversal of values is seen in both 2003 and 2004), nor with the value of NNP (the reversal can be seen in months with both positive and negative NNP).
- There can be very large changes in NNP from one sampling period to another. The noisy NNP signal that makes visual evaluation of the data difficult.

Figure 2 Net Neutralization Potential Values at General Mill Tailings (GMT) and North Splitter Box (NSB), August 2002 – December 2004



A standard approach to addressing noisy data is to apply a smoothing routine that shows the long-term trends without emphasizing the outliers. In the Final Design Report, KUCC suggested using a six-month rolling average for NNP. The results of the six-month rolling average are shown in Figure 3, together with the raw NNP data.

Figure 3 Raw and Smoothed NNP data for GMT and NSB Tailings, 2003-2004



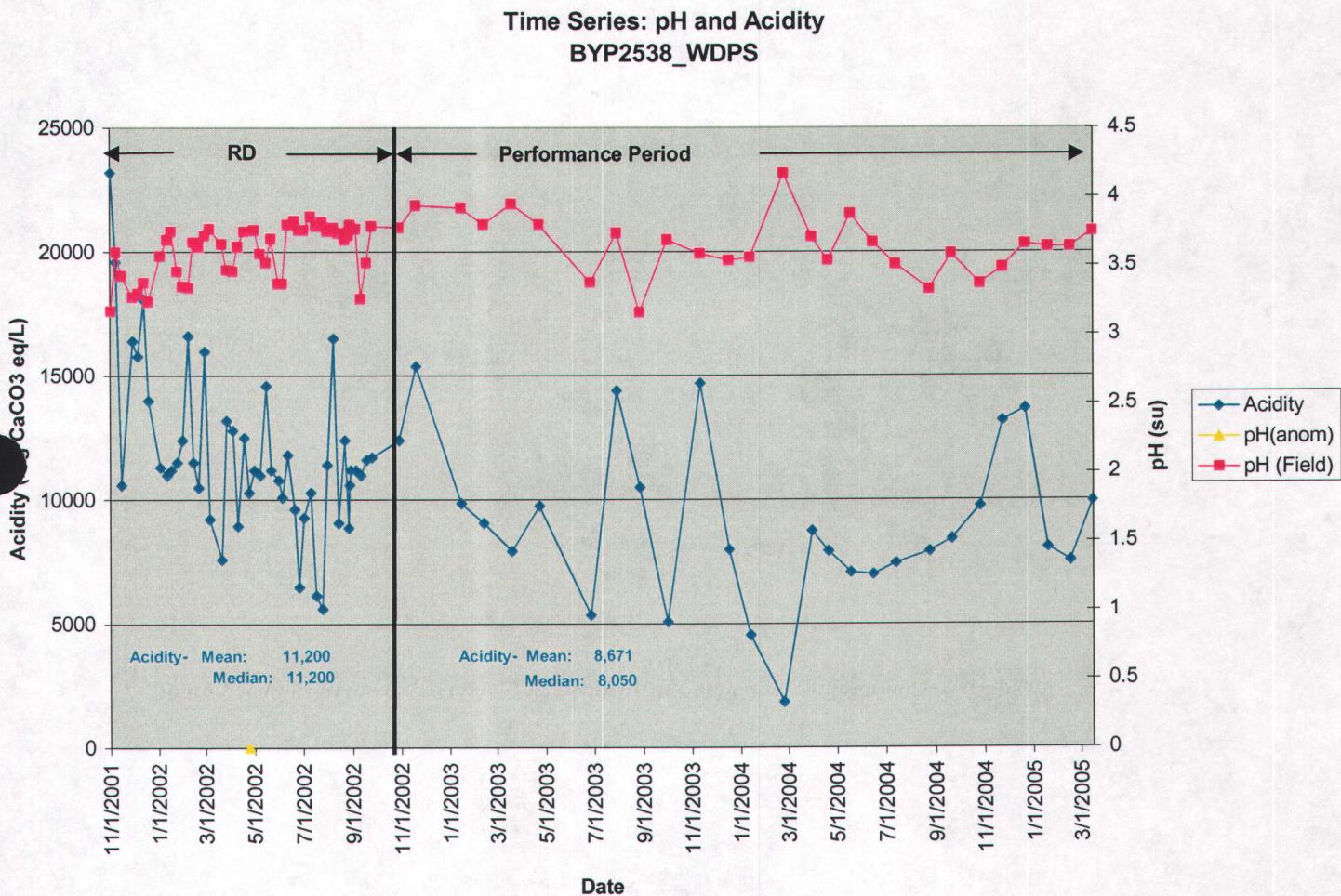
The smoothed data in Figure 3 allow one to see the general relationships more clearly (and also emphasize the noisiness of the raw data). However, the basic conclusions are the same: there are some periods in which NNP at NSB is greater than that at GMT, others in which GMT is greater. The meaning, if any, of the differences is not clear, but in this manner, also, one can see that there is no consistent depletion of NNP as a consequence of acid-water addition.

To understand the system behavior we look at the components.

### 3.2 Analysis of the Components: Acidity – Alkalinity – Neutralization Potential

Consider again the flow diagram, Figure 1. The only source of acidity to the system is the acid water flowing from WDPS to the tailing line at Drop Box NP-5. Figure 4 shows the time-series data for pH and acidity for WDPS flows.

Figure 4 pH and Acidity at Monitoring Station BYP2538: Wastewater Disposal Pump Station



With respect to the acid-base balance, the crucial result is that the aqueous acidity of the WDPS flows has declined by approximately 30%. This means that, per unit flow, the acid inputs have declined and, all else being equal, there should be less impact in 2003-2004 than was observed in 2001-2002.

The overwhelmingly predominant source of Neutralization Potential with which the acid water can react is the trailing flow. The aqueous chemistry of this flow is monitored at the

**South Facilities Remedial Action: Geochemistry of Copperton Tailing Line – 2003 - 2004**

outflow of tailing-thickener underflow as it enters NP-5 immediately ahead of the acid waters from WDPS (see Figure 1). The pH and alkalinity of this flow is shown in Figure 5.

Figure 5 pH and Alkalinity at Monitoring Station BCP2750: Thickener Underflow

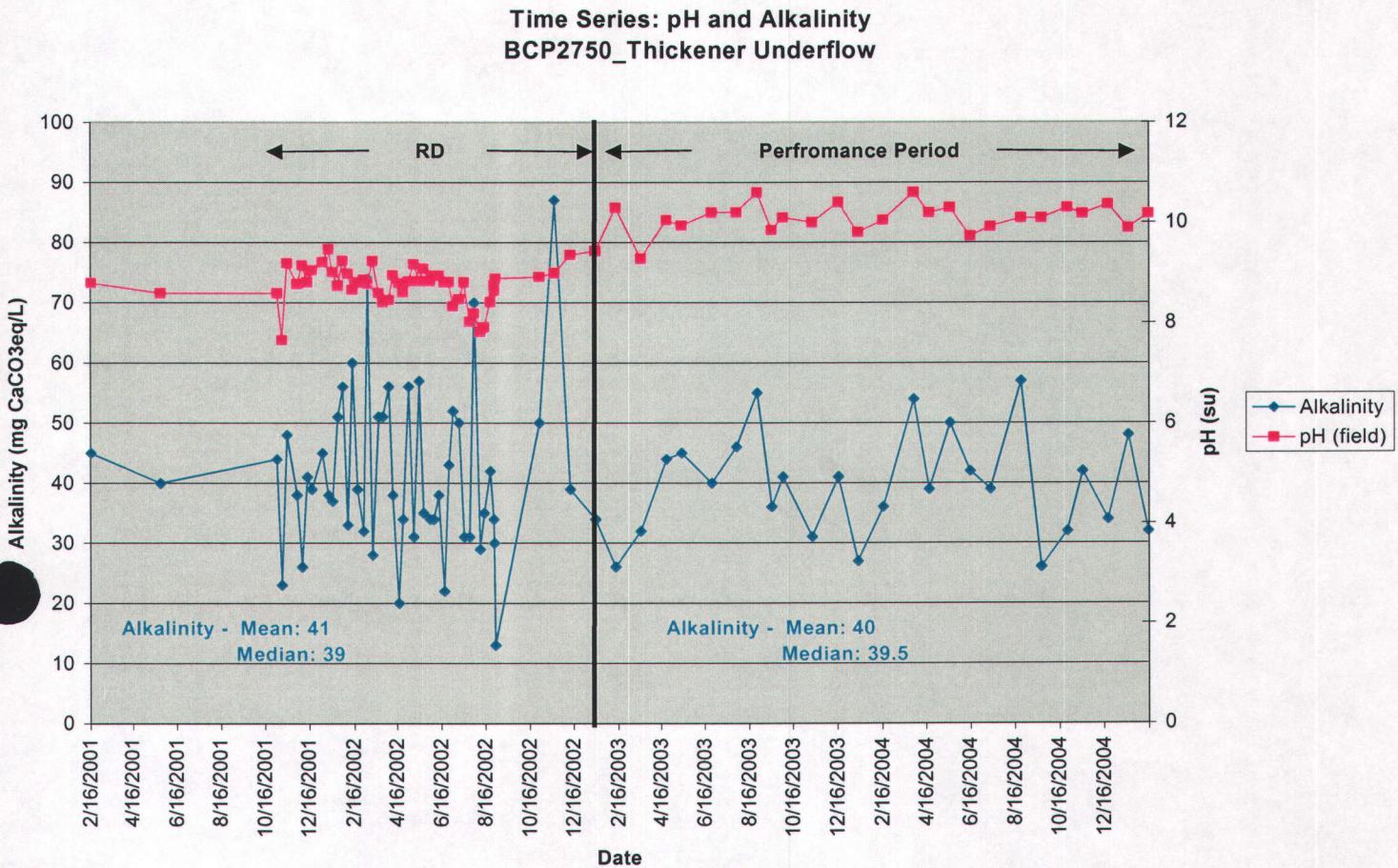
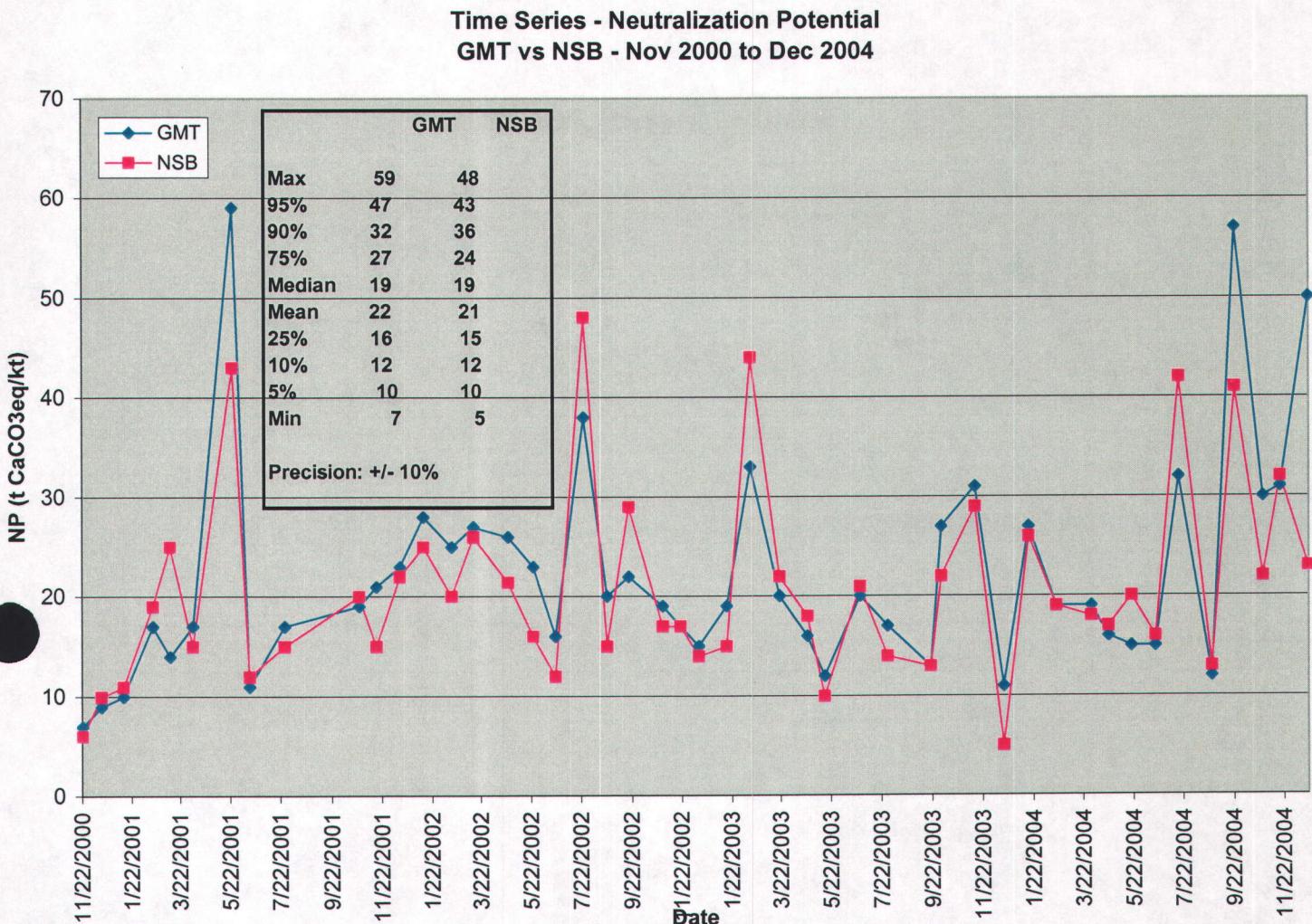


Figure 5 shows that there has been no discernible change in the aqueous alkalinity from the processed tailing. However, a comparison of tailing production shows that the operational ore processing has increased by 50% since the period of the Remedial Design, and slurry water has increased from approximately 13,000 gpm in 2001 to 28,000 gpm in 2004. Thus the total aqueous alkalinity has increased by more than 100%. Like the decline in aqueous acidity seen in the WDPS flows, the increase in total aqueous alkalinity is a favorable condition and indicates that there is less likelihood of impact during the performance period than during the design period.

The final component of the acid-base balance for the tailings system is the Neutralization Potential (NP) of the tailings solids themselves. Figure 6 shows the time series for NP.

Figure 6 Neutralization Potential of Tailing GMT and NSB, November 2000 to December 2004

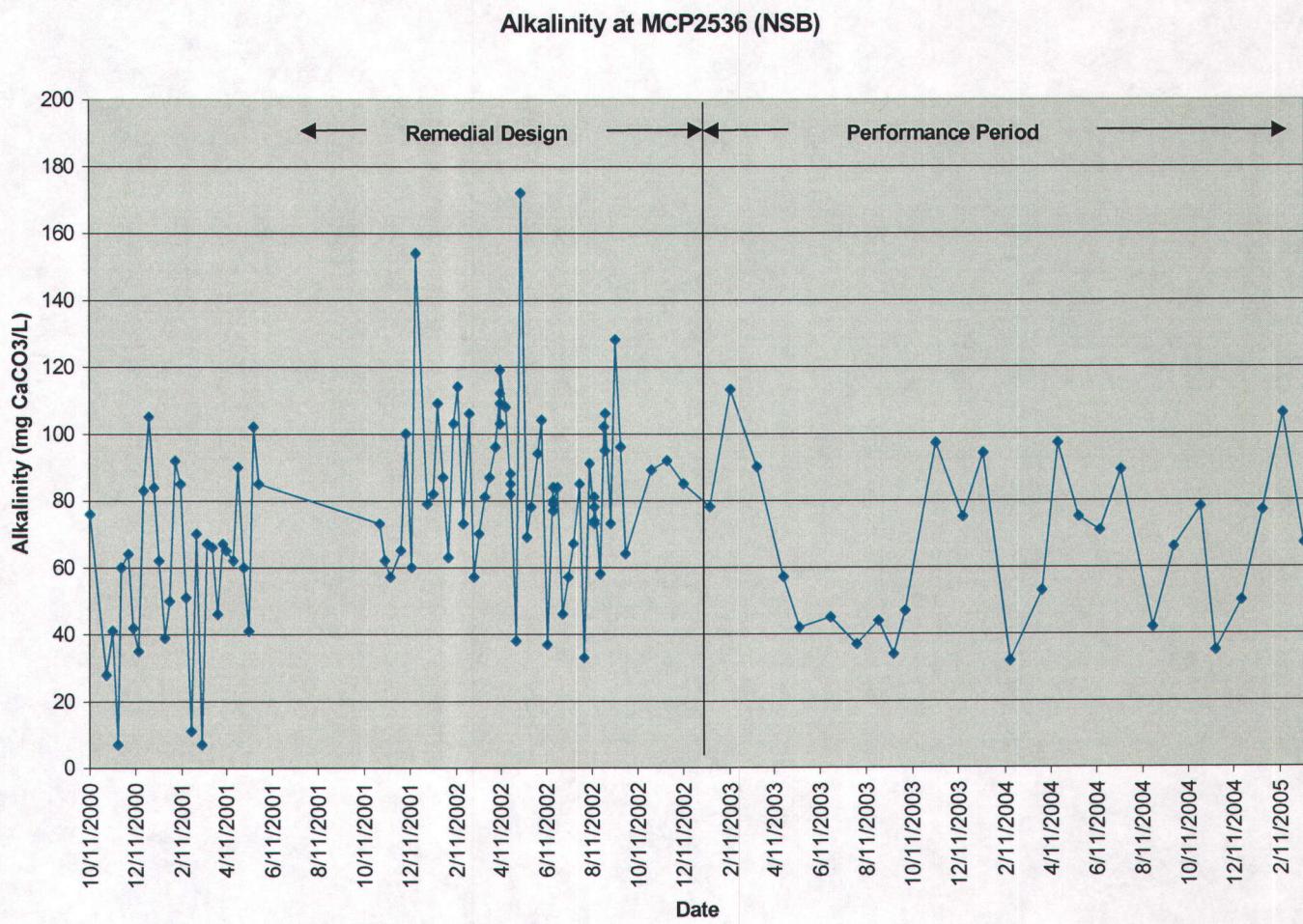


As with the NNP values, the time series NP data show that the absolute values of NP measured at GMT and NSB are randomly distributed with respect to one another: Some months GMT is greater, whereas in other months NSB is greater. When the percentiles of the measured values are compared (table in Figure 6), it is clear that there is no meaningful difference between the empirical distributions. As stated above, the output of tailing has increased by 50% since the Remedial Design was completed, meaning that there is 50% more total solid-phase Neutralization Potential available than previously.

Finally, if the data presented above show that the aqueous and solid alkalinity (capacity to neutralize strong acid) has increased, and the unit acidity of the WDPS water has decreased, then it should be the case that there is excess aqueous alkalinity present at

NSB, capable of buffering the solution pH to circum-neutral pH. This is examined in Figure 7.

Figure 7 Aqueous Alkalinity at Monitoring Station MCP2536: North Splitter Box, October 2000 to December 2004



The alkalinity data in Figure 7 show that throughout the performance period, aqueous alkalinity at NSB has remained between 30 mg CaCO<sub>3</sub>eq/L and 110 mg CaCO<sub>3</sub>eq/L, which is well within the range both before remedial action and during the Remedial Design activities. Thus, we conclude that the alkalinity and neutralization potential at NSB are adequate to preserve sufficient excess aqueous alkalinity that the pH at NSB will remain buffered in the circum-neutral range.

### 3.3 Net Neutralization Potential Revisited

The Final Design Report proposed comparing the NNP of tailing at North Splitter Box with that of tailing at GMT. Table XX presents that analysis, with a comparison of the results that includes the total uncertainty in the NNP values.

	NNP (t CaCO <sub>3</sub> /1000 t)		Rolling Average					
	GMT	NSB	GMT	+14%	-14%	NSB	+14%	-14%
Aug-02	14	17						
Sep-02	3	-2						
Oct-02	5	3						
Nov-02	4	4						
Dec-02	-26	-27	GMT	GMT+	GMT-	NSB	NSB+	NSB-
Jan-03	2	3	0	0	0	0	0	0
Feb-03	-2	3	-2	-2	-2	-3	-2	-3
Mar-03	-1	-4	-3	-3	-3	-3	-3	-3
Apr-03	-10	-3	-6	-5	-5	-4	-3	-4
May-03	-10	-9	-8	-7	-8	-6	-5	-6
Jun-03	7	7	-2	-2	-2	-1	0	0
Jul-03	1	-3	-3	-2	-2	-2	-1	-1
Aug-03	-2	-1	-3	-2	-2	-2	-2	-2
Sep-03	6	6	-1	-1	-1	0	0	0
Oct-03	15	10	3	3	3	2	2	2
Nov-03	22	10	8	9	8	5	6	5
Dec-03	9	2	9	10	8	4	5	4
Jan-04	15	5	11	12	11	5	6	5
Feb-04	2	-2	12	13	11	5	6	5
Mar-04	5	2	11	13	11	5	5	4
Apr-04	7	9	10	11	10	4	5	4
May-04	2	8	7	8	7	4	5	4
Jun-04	-6	-6	4	5	4	3	3	3
Jul-04	-4	-9	1	1	1	0	0	0
Aug-04	4	3	1	2	1	1	1	1
Sep-04	5	-1	1	2	1	1	1	1
Oct-04	12	15	2	2	2	2	2	P1
Nov-04	-11	-8	0	0	0	-1	-1	-1
Dec-04	21	15	5	5	4	3	3	P3

A.: Present at same significant figure as AP, NP, NNP

B: Assuming both NP and AP are +/- 10%, NNP is +/- 14% [Analytical uncertainty only]

Conditions:

Pass 1(P1): NSB > or = GMT

Pass 2 (P2): NSB range includes >or = NNP of 5

Pass 3 (P3): Apparent difference < or = 3.7 [To address sampling uncertainty also]

In 11 of the 24 months, the apparent absolute value at NSB is greater than that at GMT. In another 7 months, the NNP is greater than or equal to 5 t CaCO<sub>3</sub>eq/kt at both stations. In the remaining 6 months, the NSB value is apparently smaller, but falls within the range of +/- 3.7 tons CaCO<sub>3</sub>eq/kt uncertainty arising from sampling and analysis together. This in all 24 months of the performance period, once can analyze the NNP data to show that KUCC has met its acid-base balance criterion also.

### **3.4 Proposed Modification**

Because of the noisiness of the NNP data, arising significantly from having to combine uncertainties in two factors (AP and NP), KUCC recommends that the RDRA criterion be revised to a simpler and more directly relevant test.

The addition of acid water cannot change the true AP in the tailing, because that is based on pyritic sulfur in solid form. The only effect can be a reduction of NP. Therefore, we recommend that the performance criterion related to tailing-system be modified to state:

#### **C. Integration with Tailing Disposal System**

1. KUCC will meet all UPDES discharge criteria at Outfall 012 from the North Impoundment to Great Salt Lake (or other permitted outfalls).
2. The monthly Neutralization Potential (NP) value of samples collected from the tailings North Splitter Box must be either greater than or equal to the NP of Copperton Mill Tailings for the month or at least 5 t CaCO<sub>3</sub>eq/kt. The monthly NNP value will be determined based on a rolling six-month average from monthly composite samples collected at the GMT and tailings impoundment discharge locations. In making comparisons, the uncertainty in both GMT and NSB will be taken to be 10% of the average value, and a significant difference must lie outside the joint uncertainty.
3. The aqueous pH at North Splitter Box must be greater than or equal to 6.7 and the aqueous alkalinity must be greater than or equal to 10 mg CaCO<sub>3</sub>eq/L. These parameters, too, will be evaluated as rolling six-month averages.

## **CONCLUSIONS**

Based on the 2003 and 2004 data, KUCC concludes that all three components of the remedial-design requirements for use of the tailings line were met:

- The Copperton tailing line can routinely handle flows greater than or equal to 3,500 gpm of acidic water from Wastewater Disposal Pump Station (WDPS)
- The pH at North Splitter Box was greater than pH 6.7 throughout 2003 and 2004.
- The Net Neutralization Potential (NNP) values show that the addition of acidic water from WDPS did not compromise the intrinsic acid-base balance of the tailing compared to discharge values from the processed ore itself.

KUCC recommends a slightly revised tailing criterion, using Neutralization Potential, pH and alkalinity, instead of the more complex and more uncertain NNP.

## REFERENCES

Geochimica, Inc., 2002. Geochemical Revaluation: Treating Acid Waters in the Copperton Tailing Line (Version A.3, December 2002). Appendix C to KUCC (2002).

Kennecott Utah Copper Corporation (KUCC), 2002. *Final Design for Remedial Action at South Facilities Groundwater*, December 2002.